

EVOLUZIONE GEOLOGICA DELLA LAGUNA DI VENEZIA

Sandra Donnici

“Le lagune altoadriatiche,
tra le Alpi e il Mare, tra Passato e Presente”



Club Alpino Italiano

LXI Corso nazionale di formazione per insegnanti

22 – 26 aprile 2023

Cavallino Treporti (VE)



Mappa senza titolo

Scrivi una descrizione per la tua mappa.







Sondaggi
geognostici

Rilievi geofisici

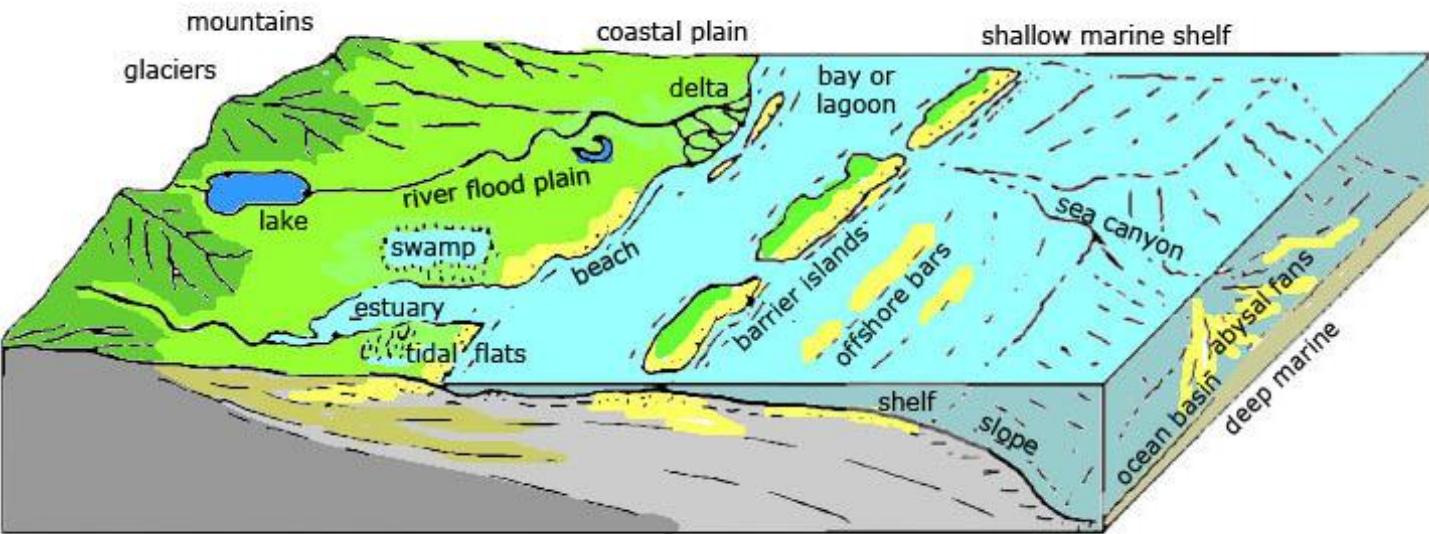
I sedimenti: un
archivio
naturale

Analisi
stratigrafiche

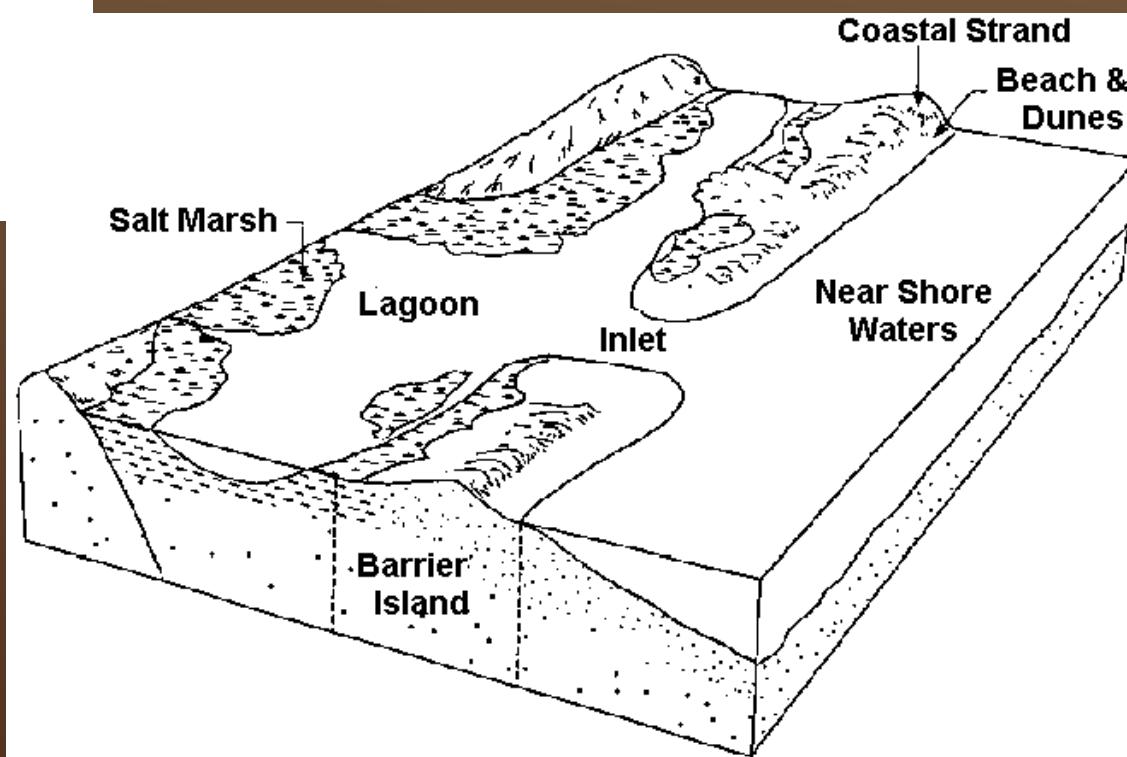
Analisi micro-
paleontologi
che

Clastic depositional environments

Humid regions



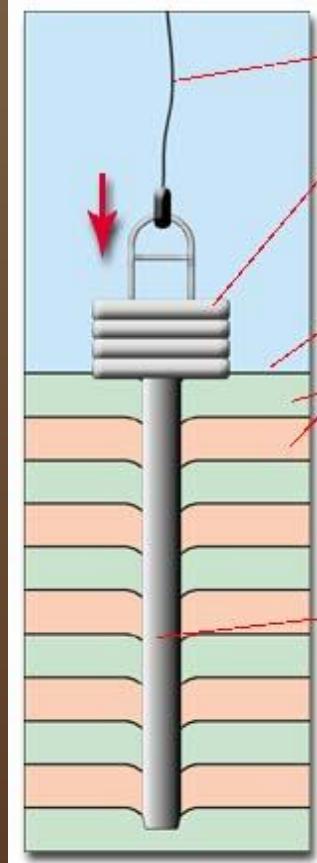
L'AMBIENTE DI DEPOSIZIONE LAGUNARE



Sondaggi geognostici



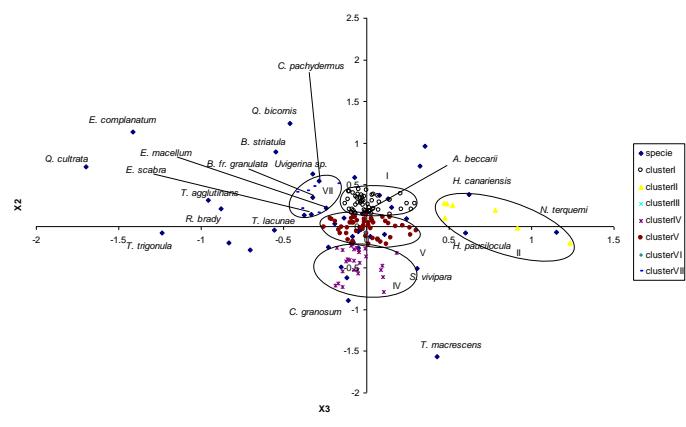
perforazione di pozzi per il campionamento dei sedimenti nel sottosuolo



tramite il carotiere si prelevano campioni cilindrici di sedimento



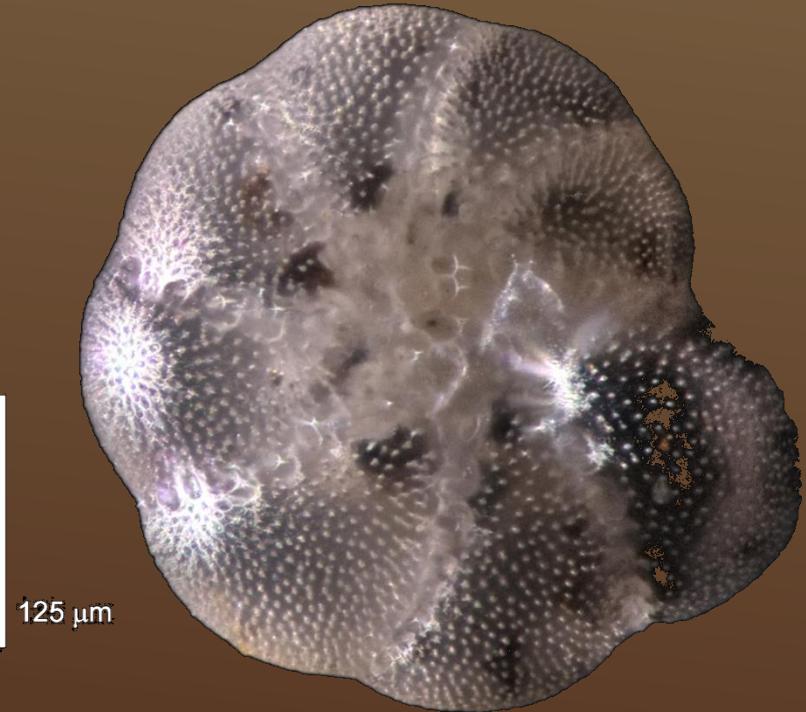
Analisi stratigrafiche



Preparazione del campione
Riconoscimento al microscopio;
Analisi quantitativa
varietà di specie
stretta relazione con variabili ambientali
ricostruzione dei paleoambienti marini e lagunari

Analisi micropaleontologica

I FORAMINIFERI



Sono organismi unicellulari dotati di un guscio

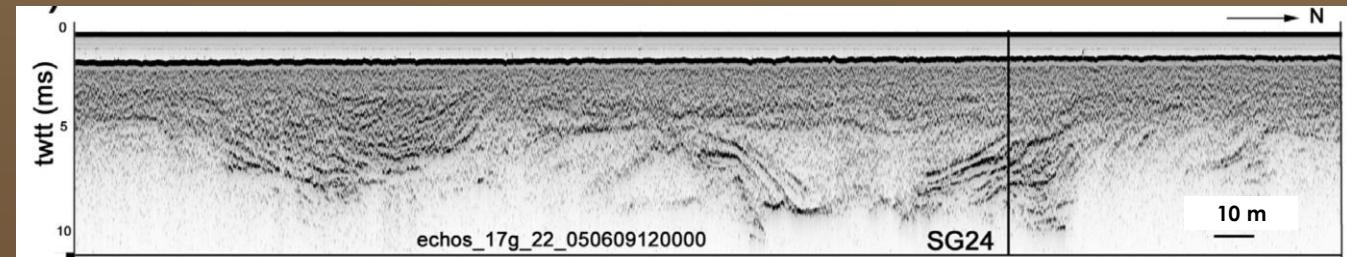
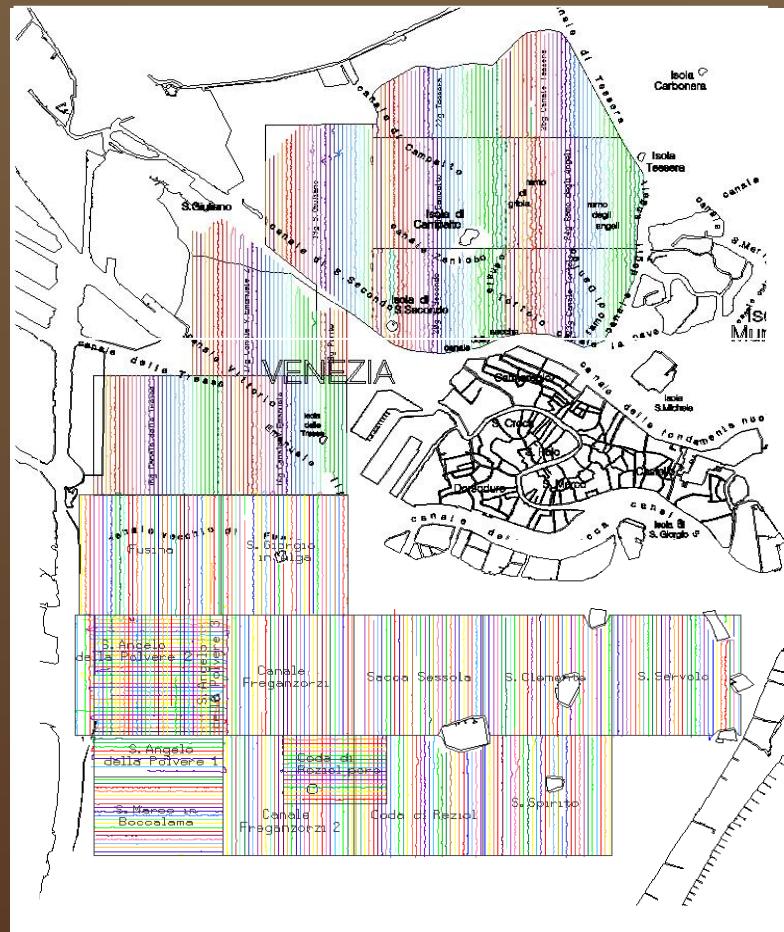
La dimensione media è attorno a 0,5 mm

Sono diffusi in tutti gli ambienti marini, dal Cambriano all'Attuale

I loro gusci si conservano nel sedimento,
dove se ne possono accumulare migliaia per centimetro cubico

Grande varietà di specie

Stretta relazioni con le variabili ambientali

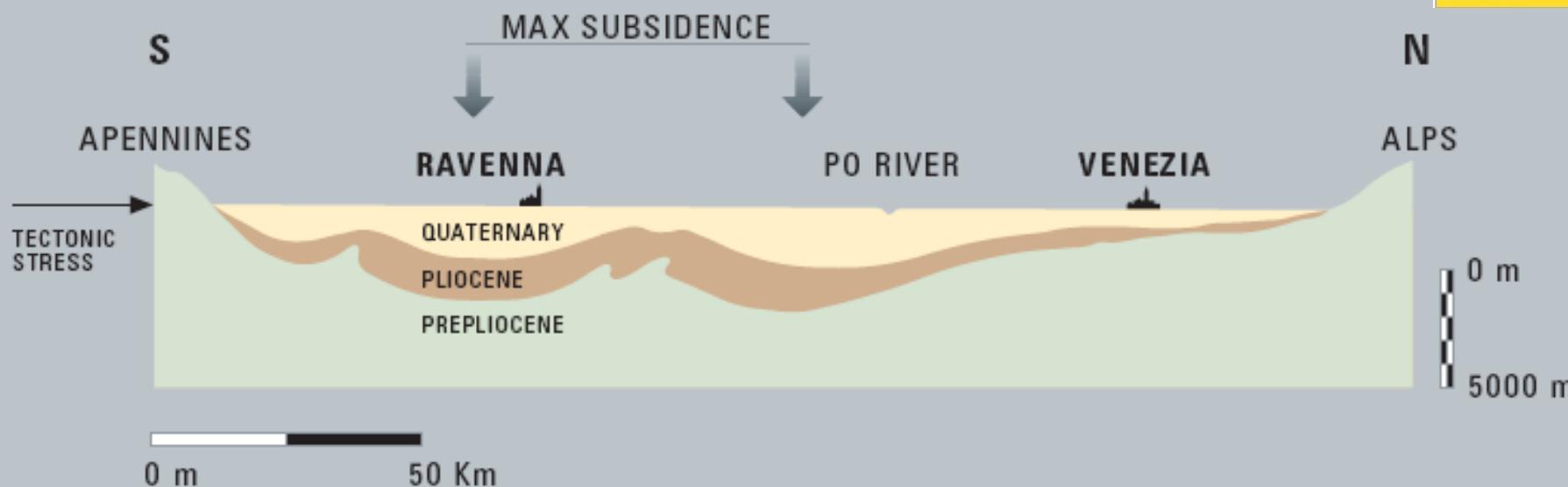


Rilievi geofisici



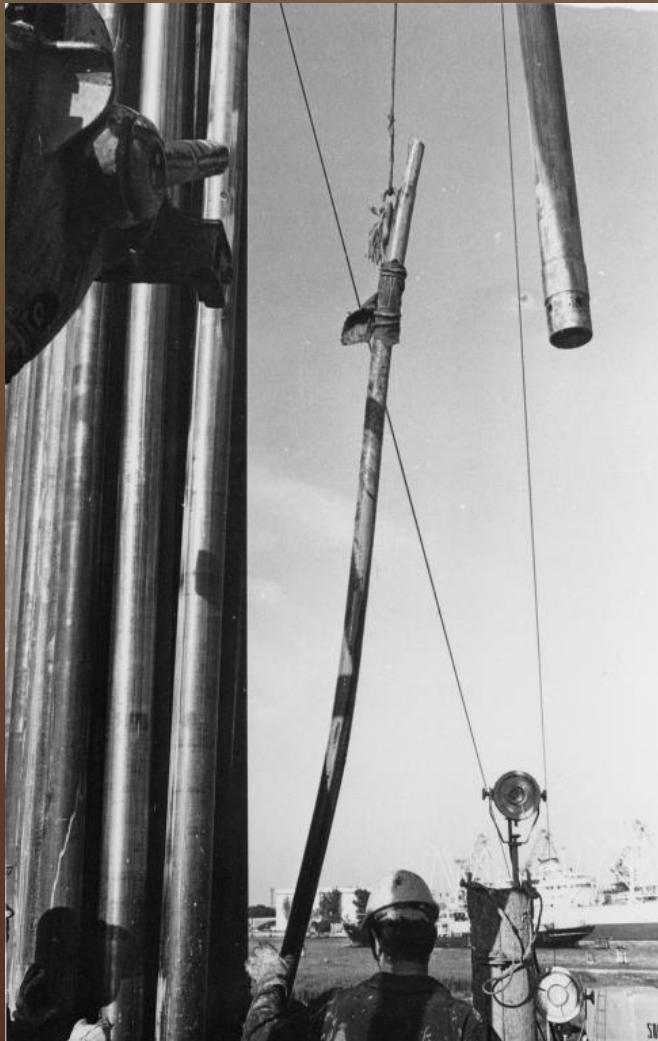
Prima
della
laguna

SEZIONE SCHEMATICA DELLA PIANURA PADANA

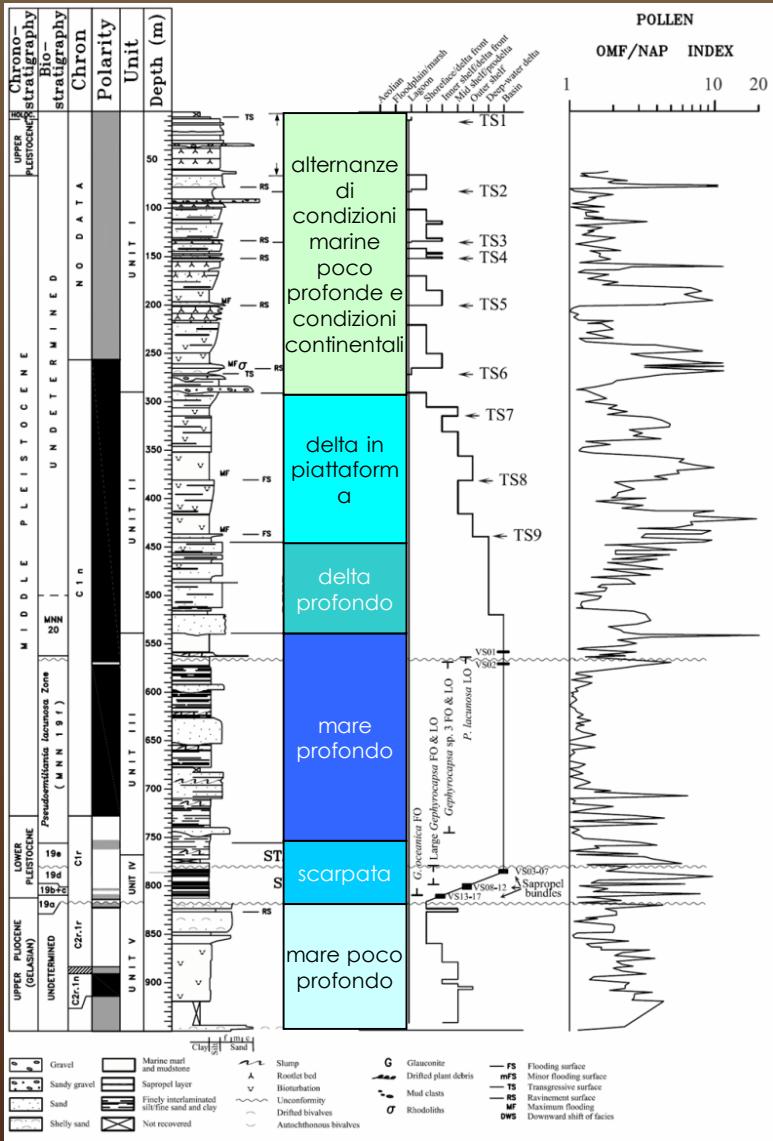


Suddivisione del Periodo Quaternario				
Periodo	Epoca	Età / Piano	Datazione (Ma)	
Quaternario	Olocene	Meghalayano	0	0.0042
		Nordgrippiano	0.0042	0.0082
		Groenlandiano	0.0082	0.0117
	Pleistocene	Tarantiano	0.0117	0.129
		Ioniano	0.129	0.774
		Calabriano	0.774	1.80
Neogene	Pliocene	Gelasiano	1.80	2.58
		Piacenziano	Più antico	

IL POZZO “VENEZIA 1 – CNR”



- ▶ 1971
- ▶ Isola nuova del Tronchetto
- ▶ profondità 947 m

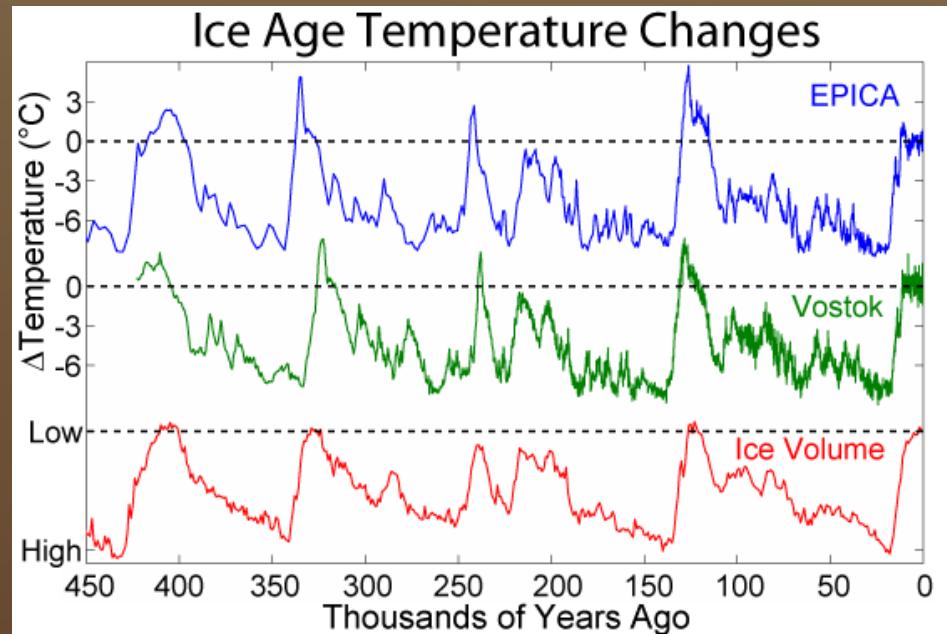
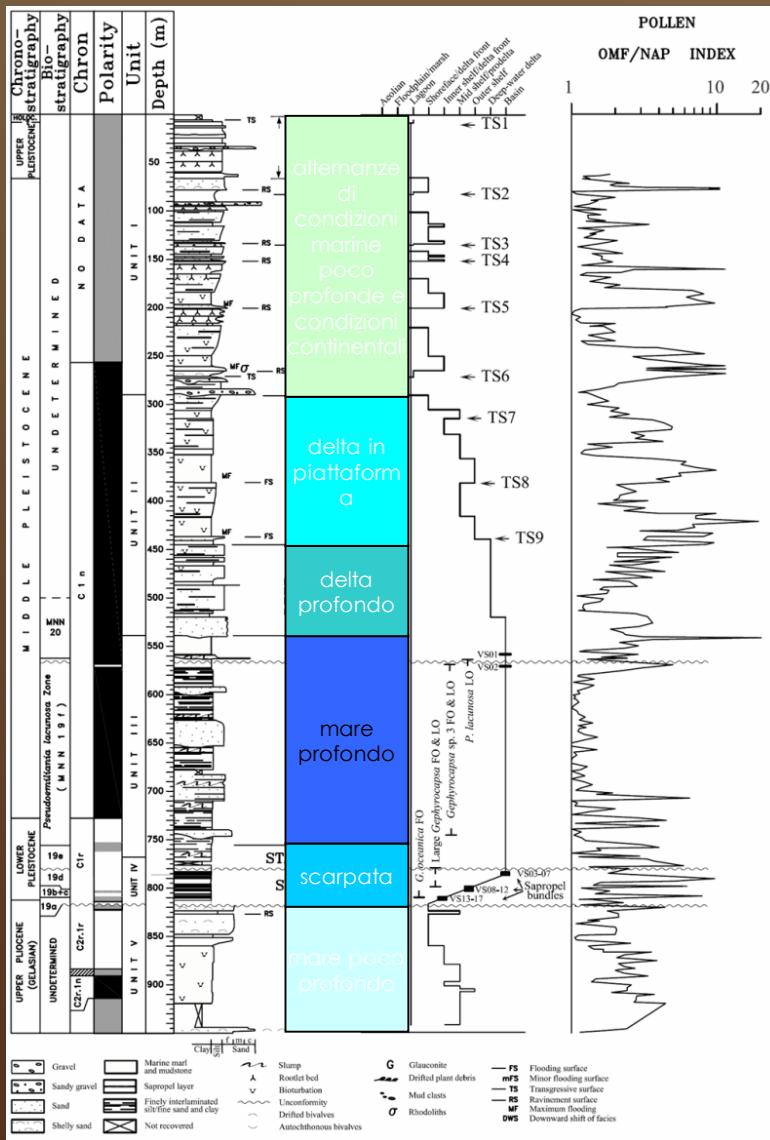


UNITA'	PROFONDITA' (m)	ETA' (Ma)
I	0-300	0-0,24
II	300-550	0,24-0,4
III	550-750	0,4-1
IV	750-820	1-1,8
V	820-950	>1,8



IL POZZO “VENEZIA 1 – CNR”

da Massari et al., 2004



IL POZZO “VENEZIA 1 – CNR”

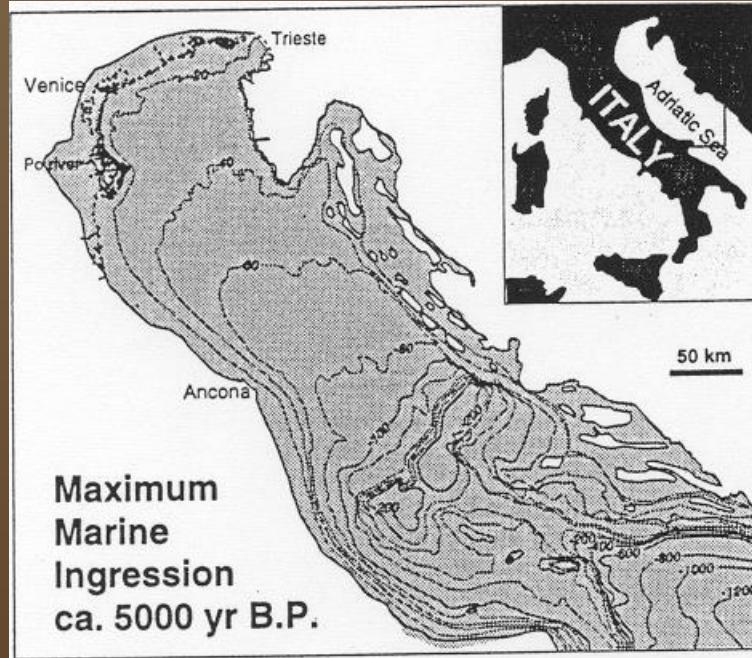
da Massari et al., 2004

ULTIMO MASSIMO GLACIALE ~20.000 ANNI FA

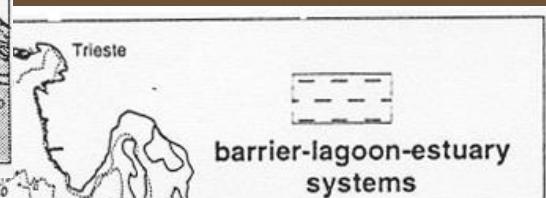




Formazione della laguna

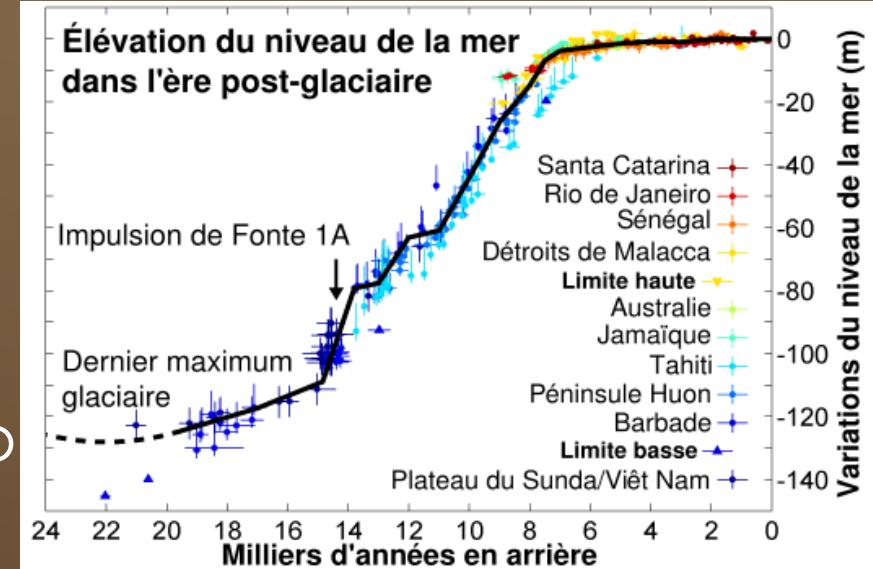
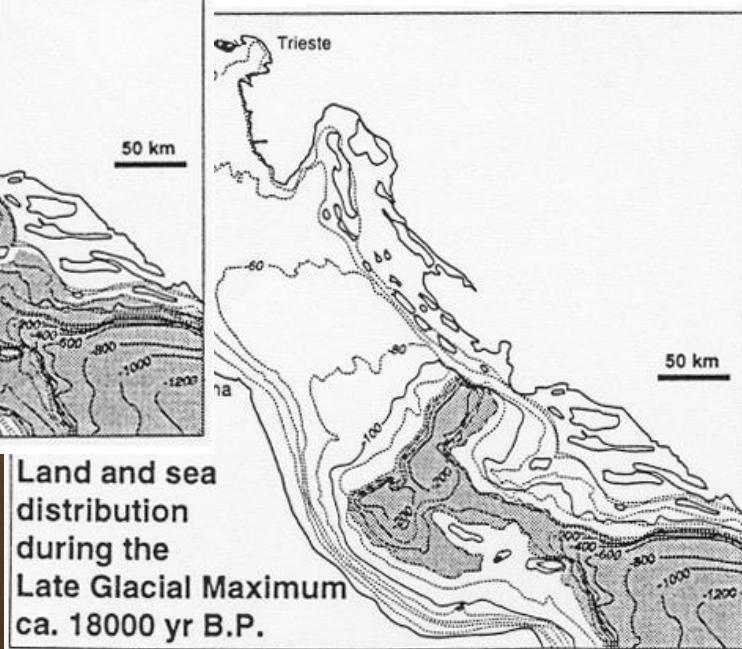


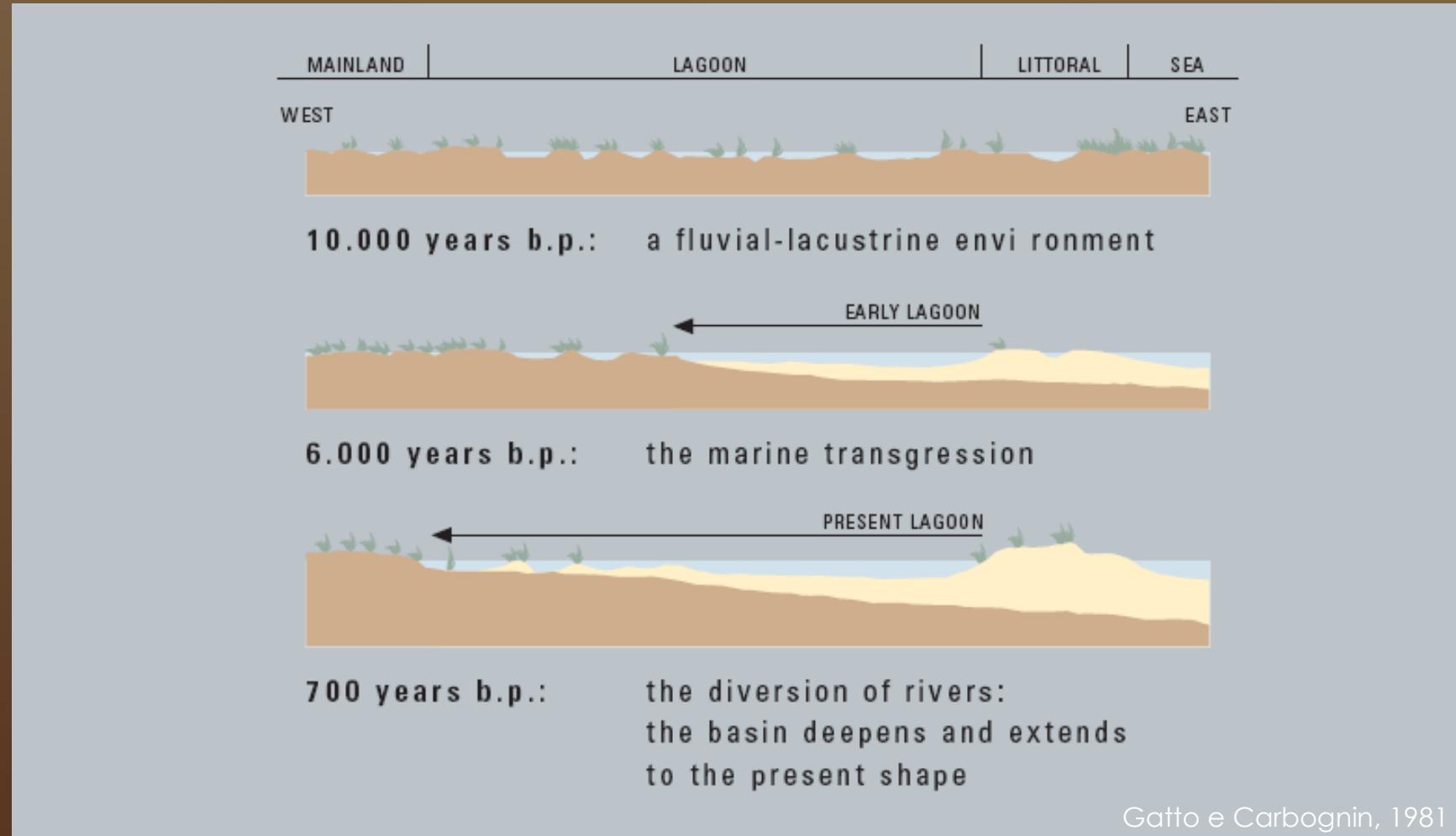
Innalzamento temperatura Scioglimento ghiacciai Risalita livello marino



Progressivo
allargamento
del Mare
Adriatico
durante il tardo
Quaternario

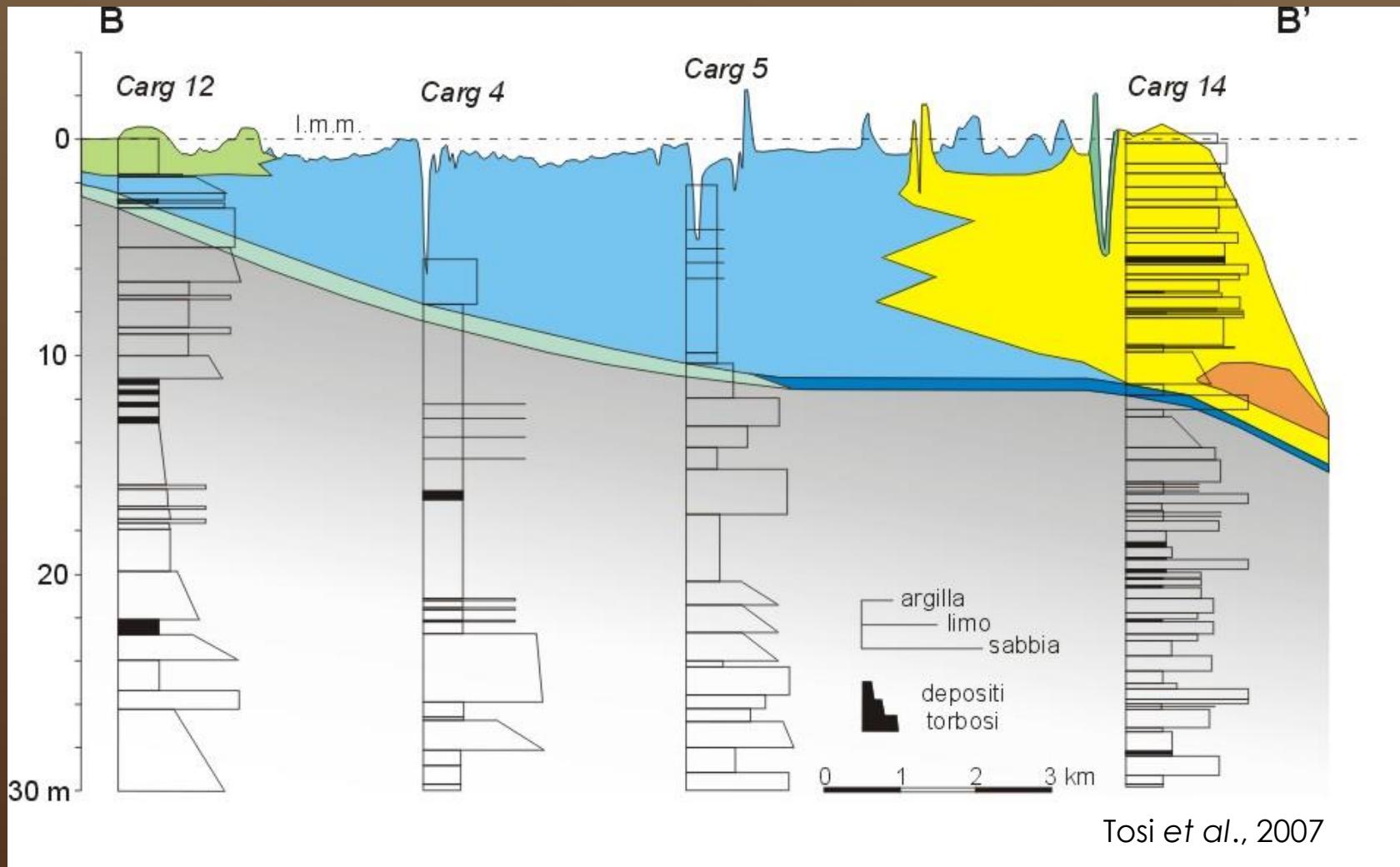
(Correggiari et al., 1996)





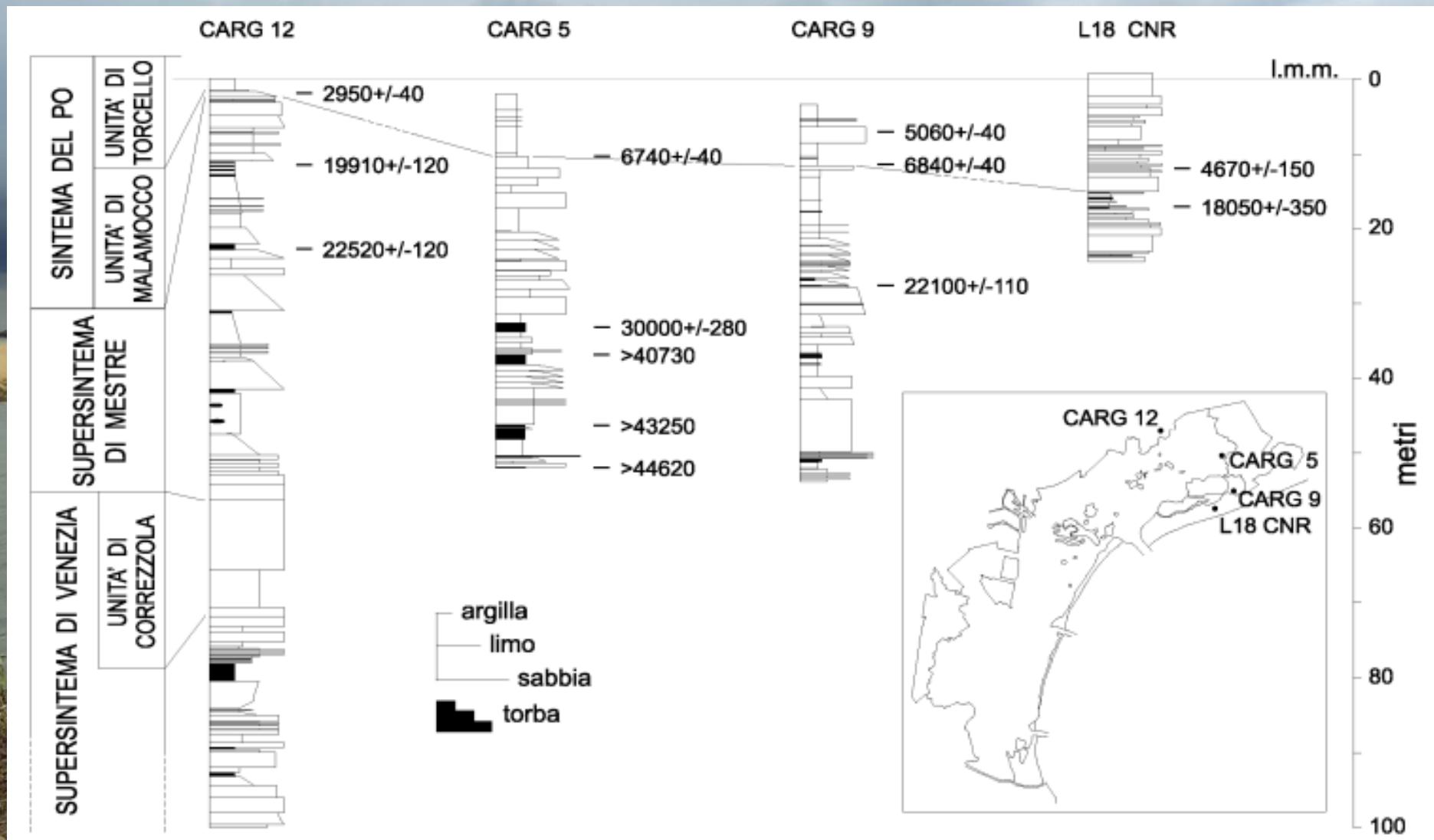
FORMAZIONE DELLA LAGUNA DI VENEZIA

Laguna settentrionale



- | | |
|----------------------------------------|---------------------------------------------------------|
| depositi alluvionali | depositi deltizi |
| depositi trasgressivi di retrobarriera | depositi di barriera trasgressiva e di cordone litorale |
| depositi basali di sovraluvionamento | depositi di transizione alla piattaforma |
| depositi lagunari | depositi alluvionali pleistocenici |

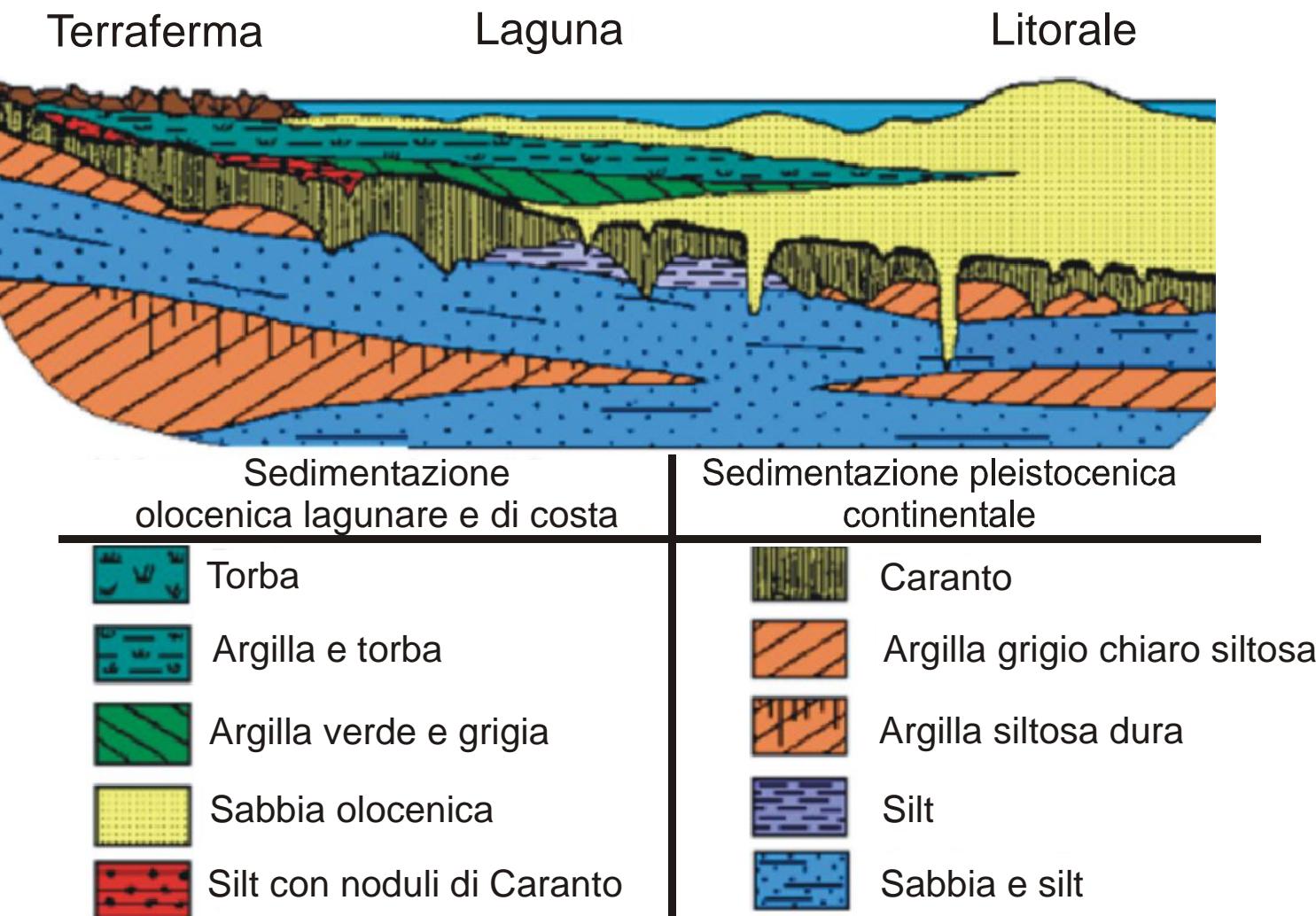




Consiglio Nazionale
delle Ricerche

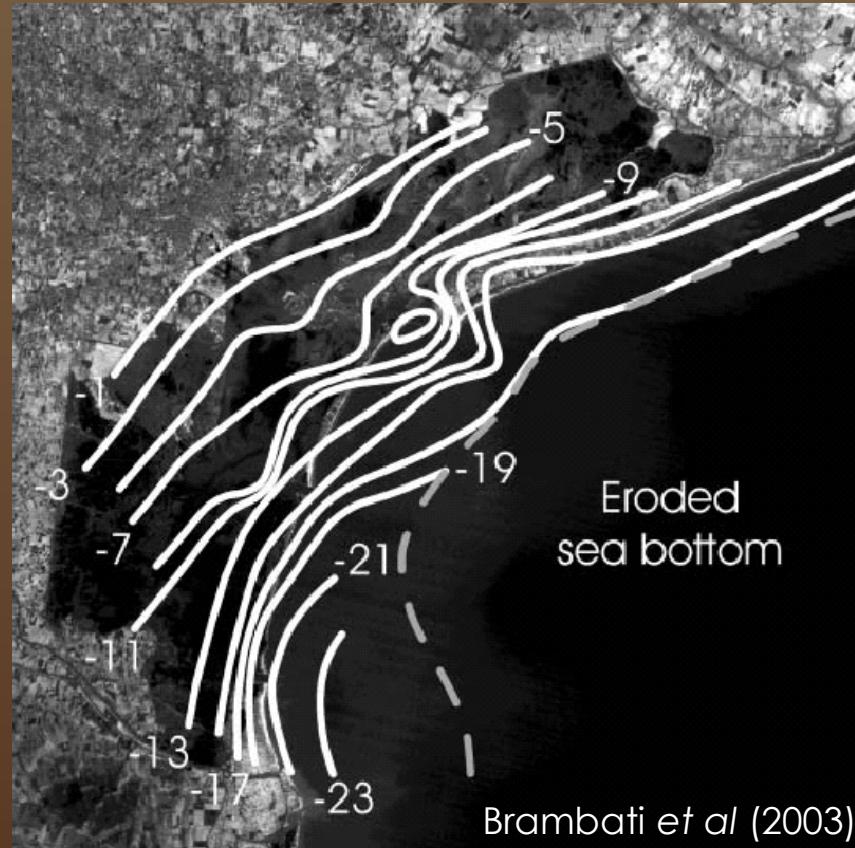
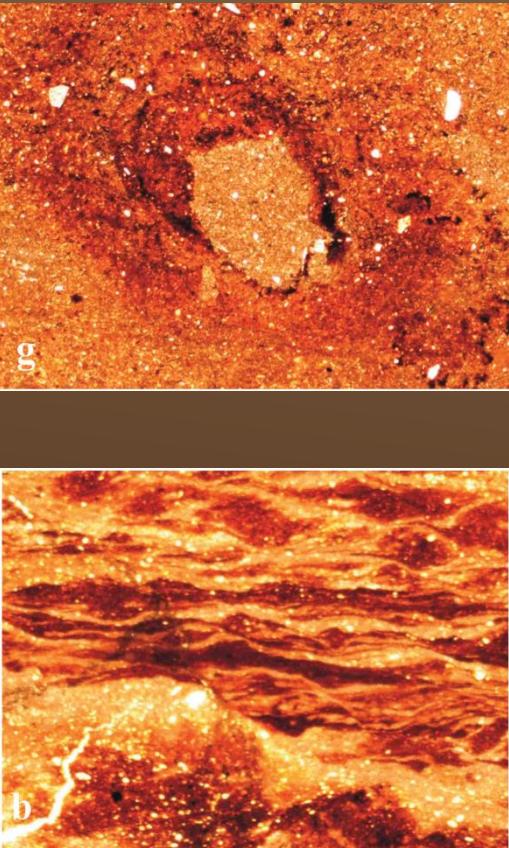


Sequenza stratigrafica tardo-pleistocenica ed olocenica

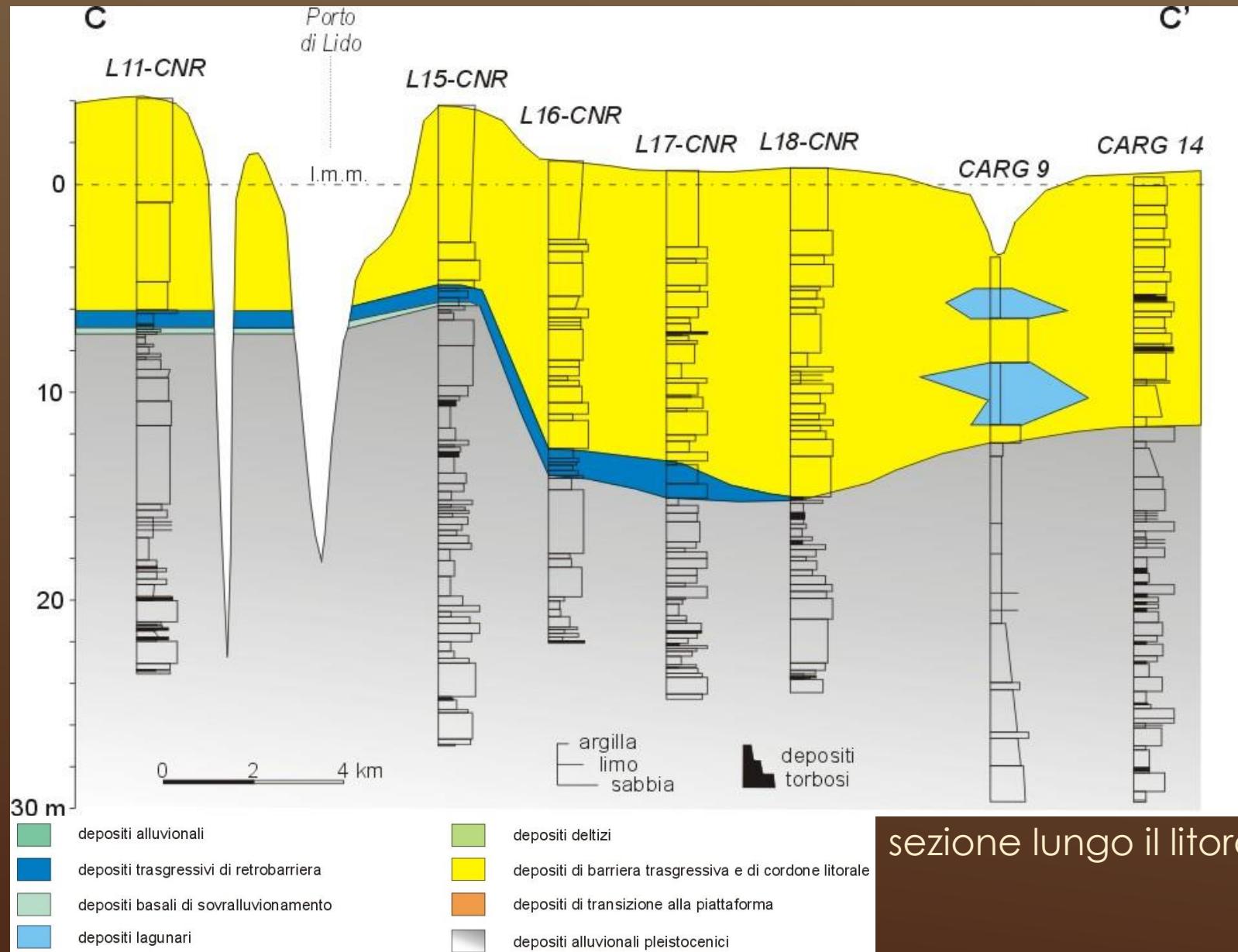


(modificata da Gatto & Previtallo, 1974)

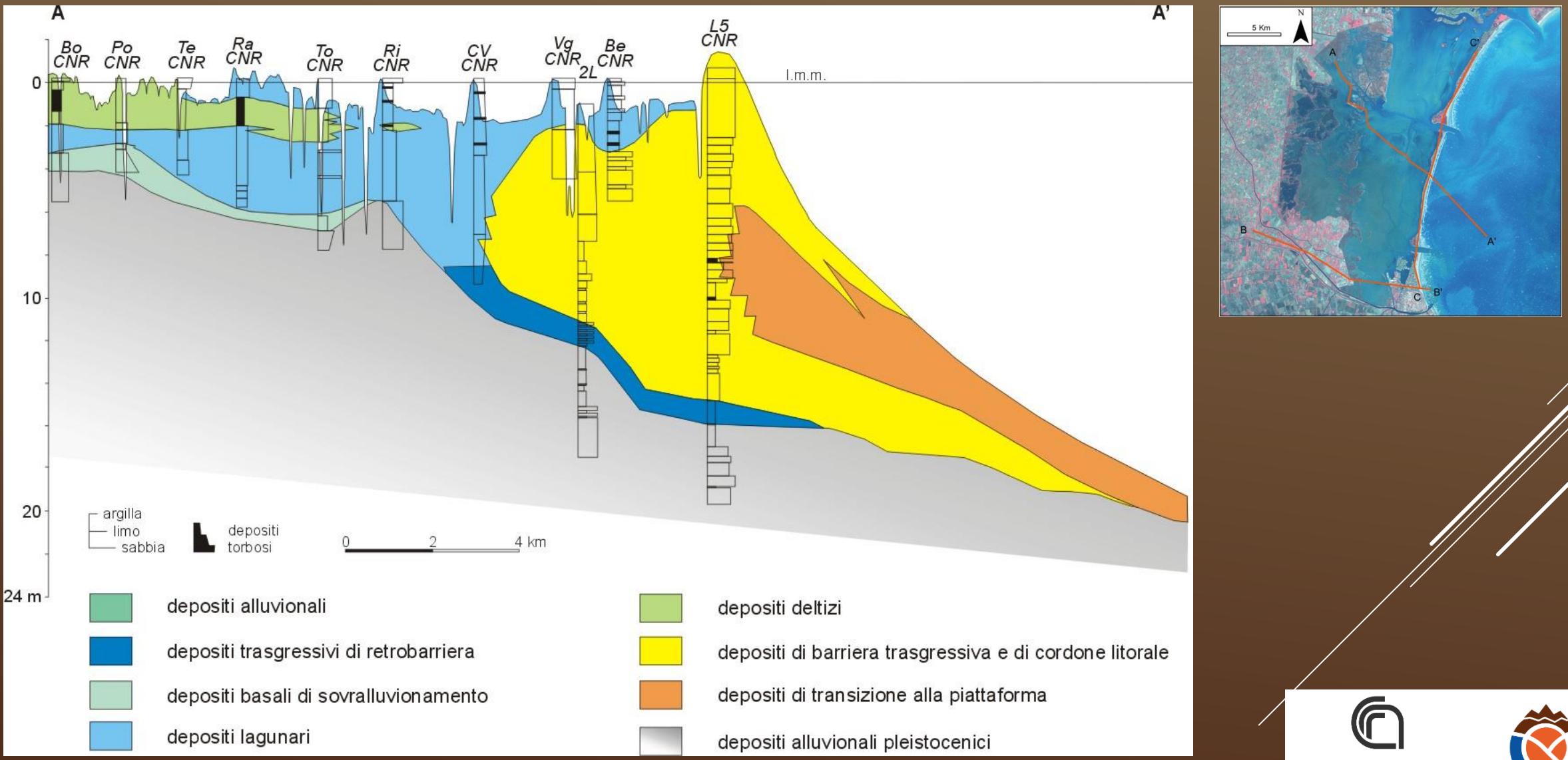
IL LIMITE PLEISTOCENE-OLOCENE E IL CARANTO



Laguna settentrionale

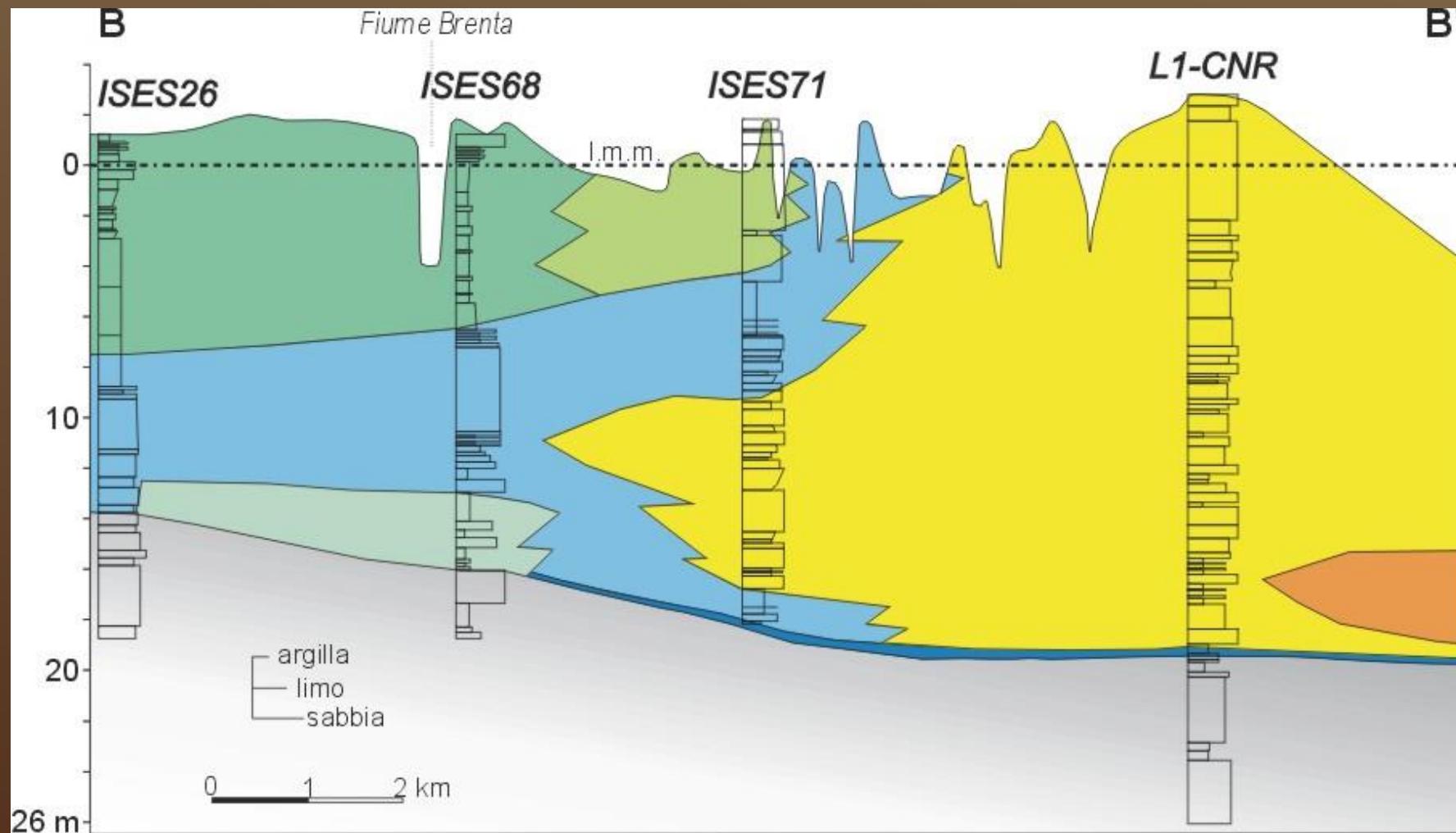


Laguna meridionale

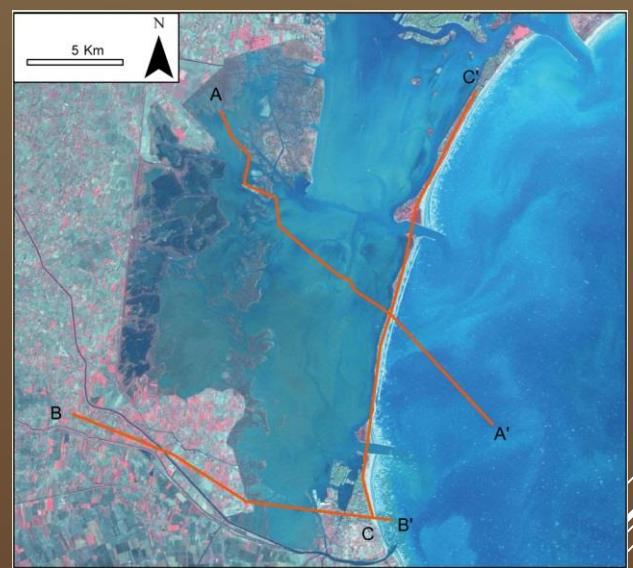


Tosi et al., 2007

Laguna meridionale



Tosi et al., 2007





Evoluzione della laguna

Evoluzione olocenica del litorale



- Nell'area centro-settentrionale prevalse la tendenza trasgressiva marina fino a quando venne ricoperto anche l'alto strutturale individuato presso la bocca di Lido
- A Sud, raggiunta la massima ingressione marina, iniziò la progradazione del litorale. L'abbondante apporto solido dei fiumi Adige, Brenta e Bacchiglione non fu più equilibrato dall'innalzamento eustatico, ed iniziarono ad avanzare i loro apparati di foce



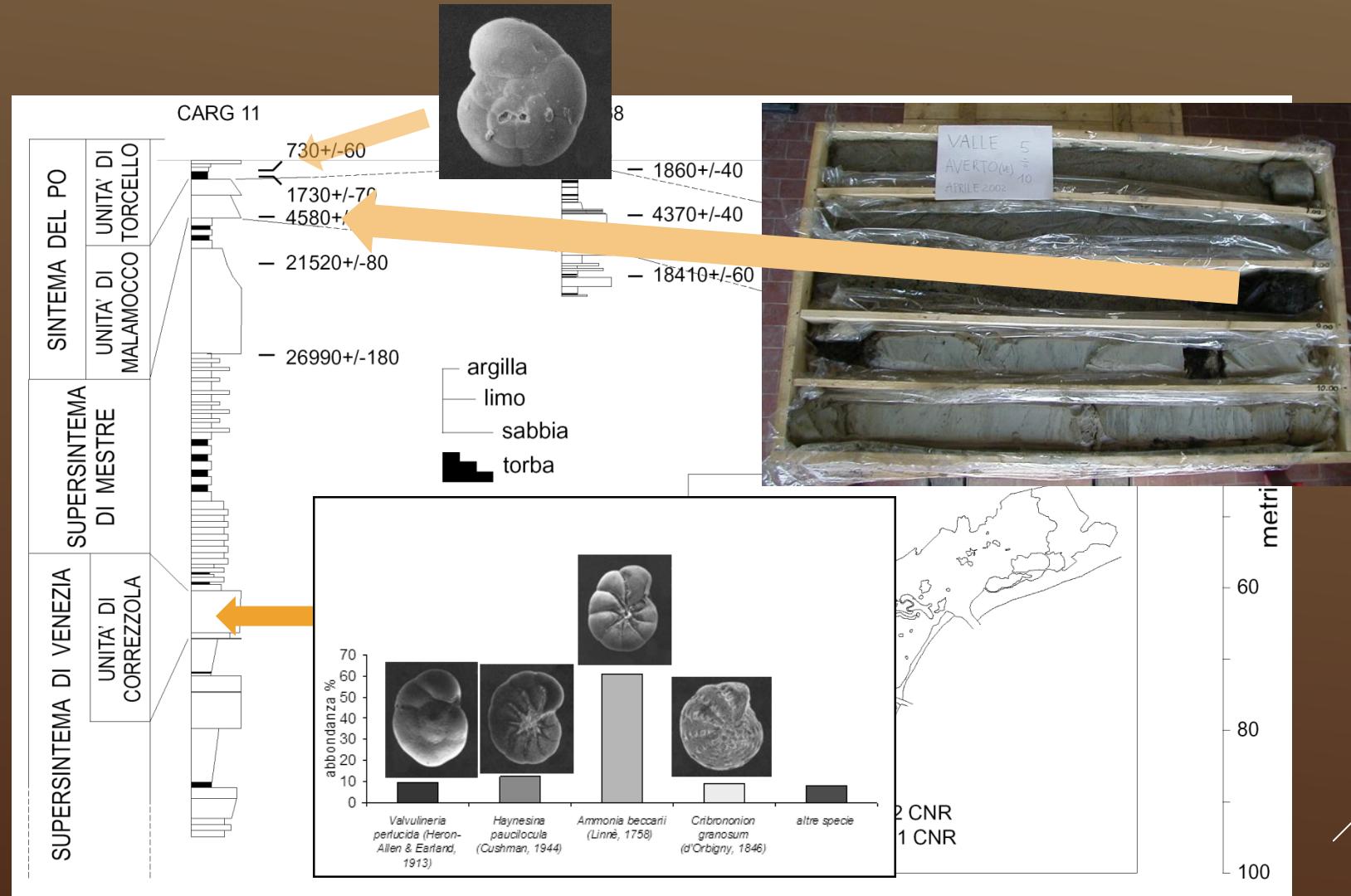
(Bondesan e Meneghel, 2004)

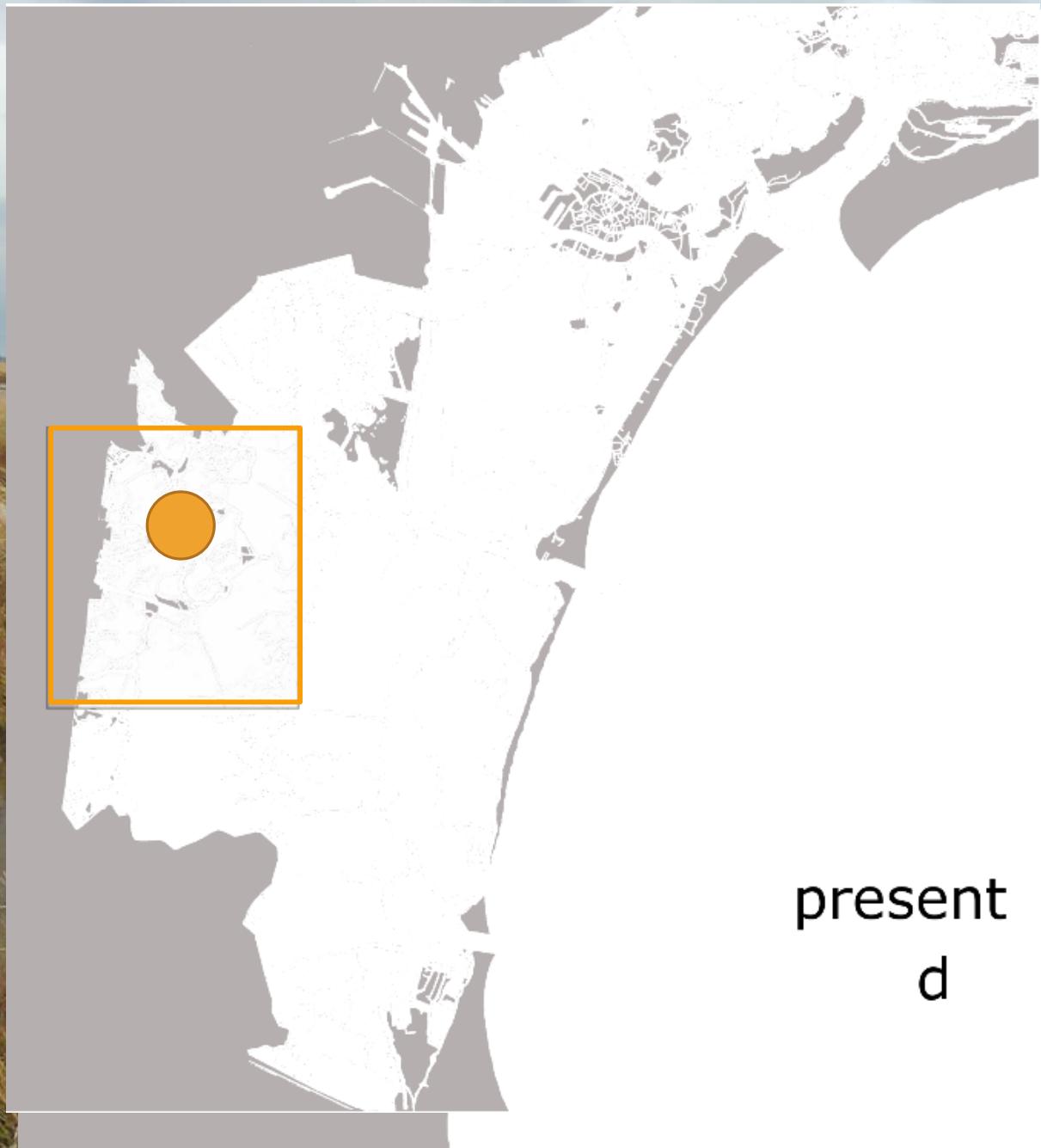
LE VARIAZIONI DELLA LINEA DI COSTA NEL SETTORE MERIDIONALE DELLA LAGUNA DI VENEZIA

- A limite della massima ingressione olocenica 6000 BP (Favero e Serandrei Barbero, 1980)
- B linea di costa San Pietro di Cavarzere – Motte Cucco – Motta Palazzetto – Peta de Bo 5000 BP
- C linea di costa Cavanella d'Adige – Sant'Anna – Chioggia 2500 BP
- D linea di costa attuale

Il racconto dei sedimenti

L'espansione della laguna sul margine continentale: l'area di Valle Averto nel bacino lagunare centrale

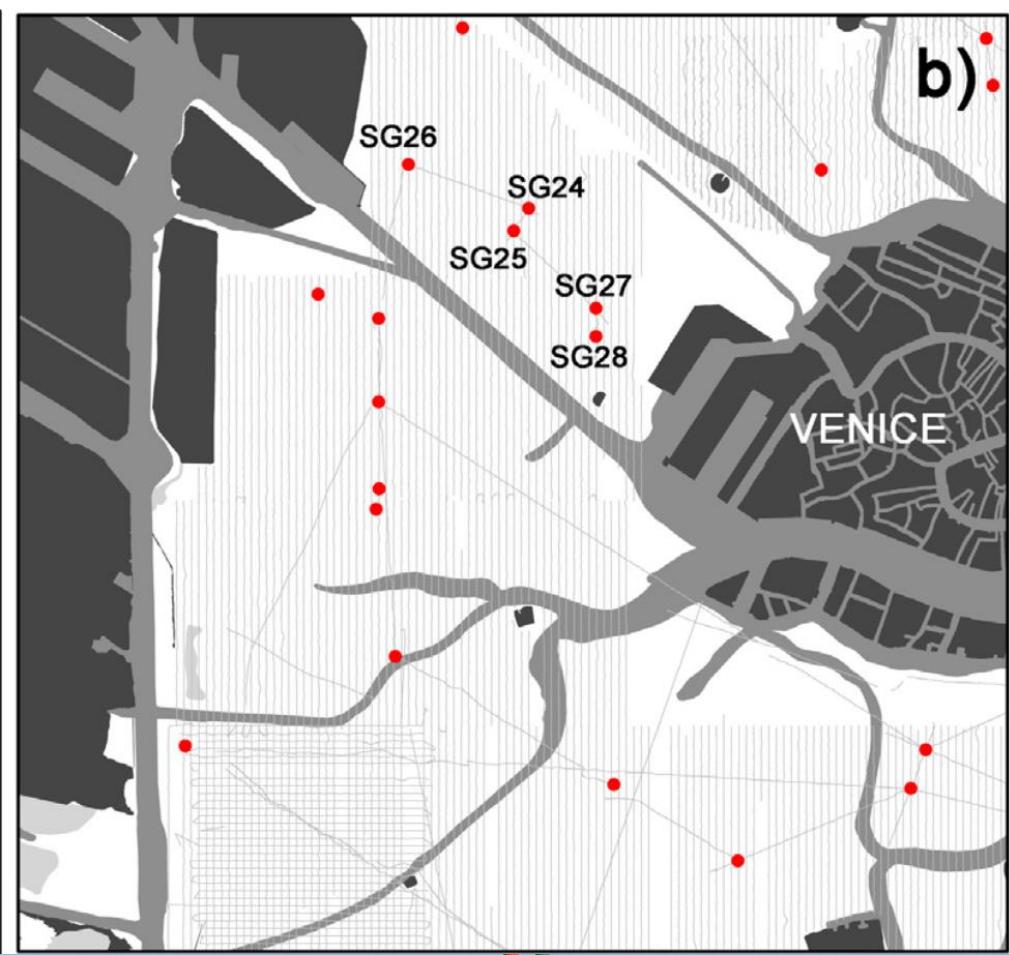




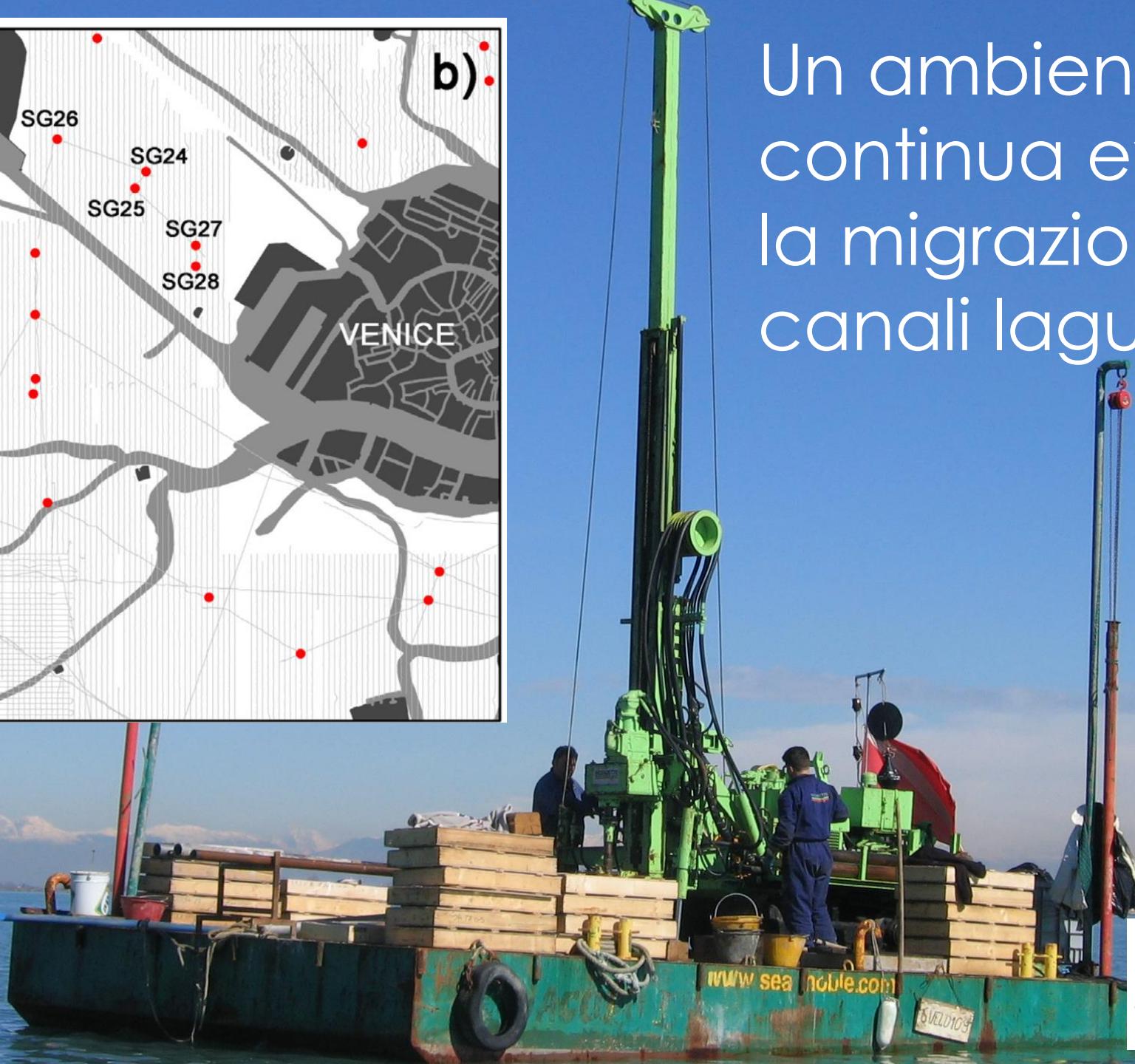
present
d

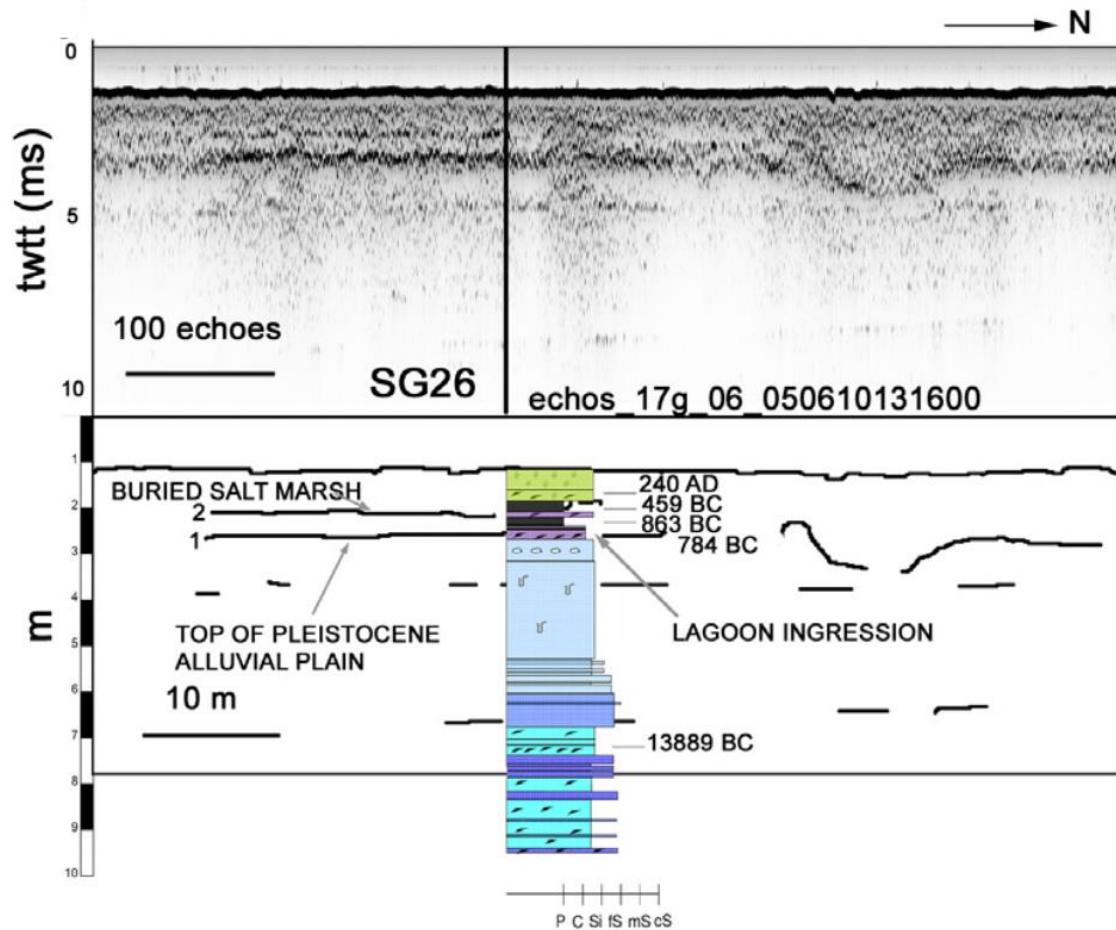
Donnici e Serandrei-Barbero, 2022





Un ambiente in
continua evoluzione:
la migrazione dei
canali lagunari





SEDIMENTARY FACIES

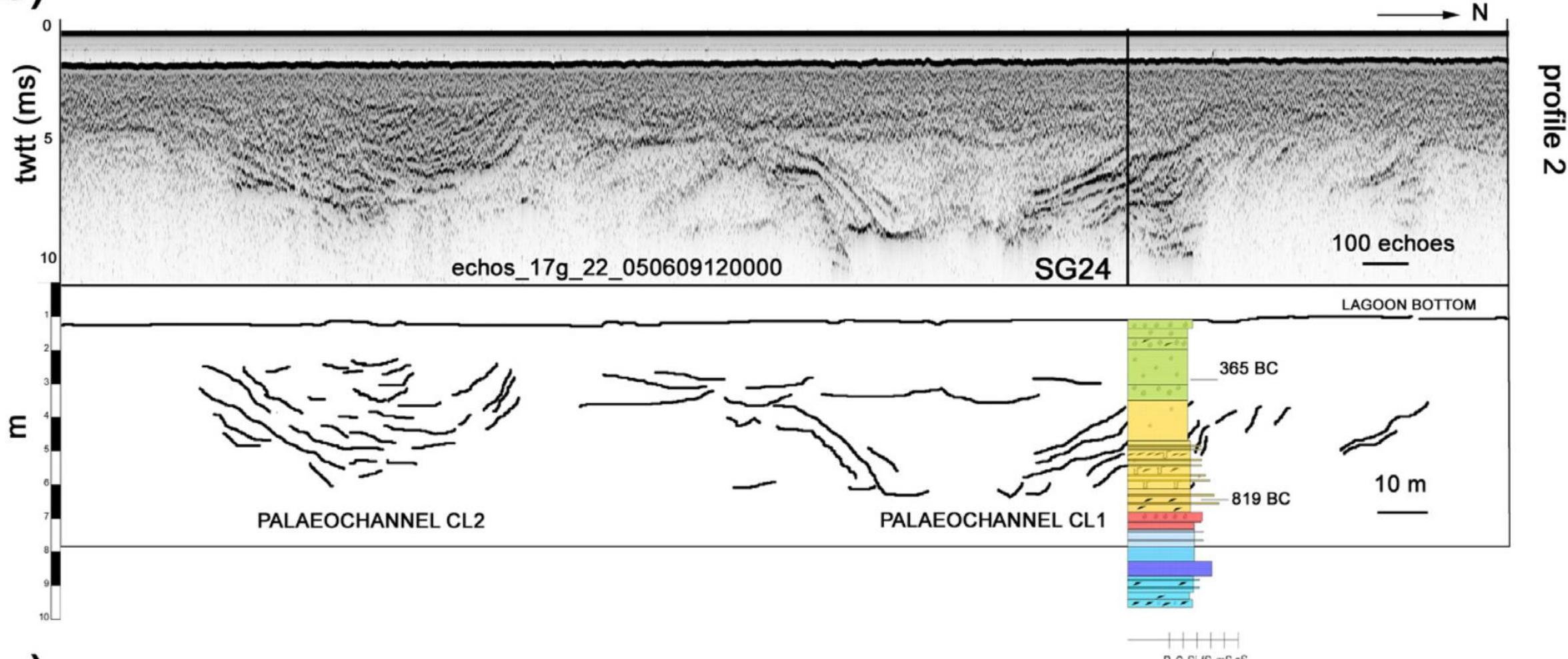
LAGOONAL FACIES L

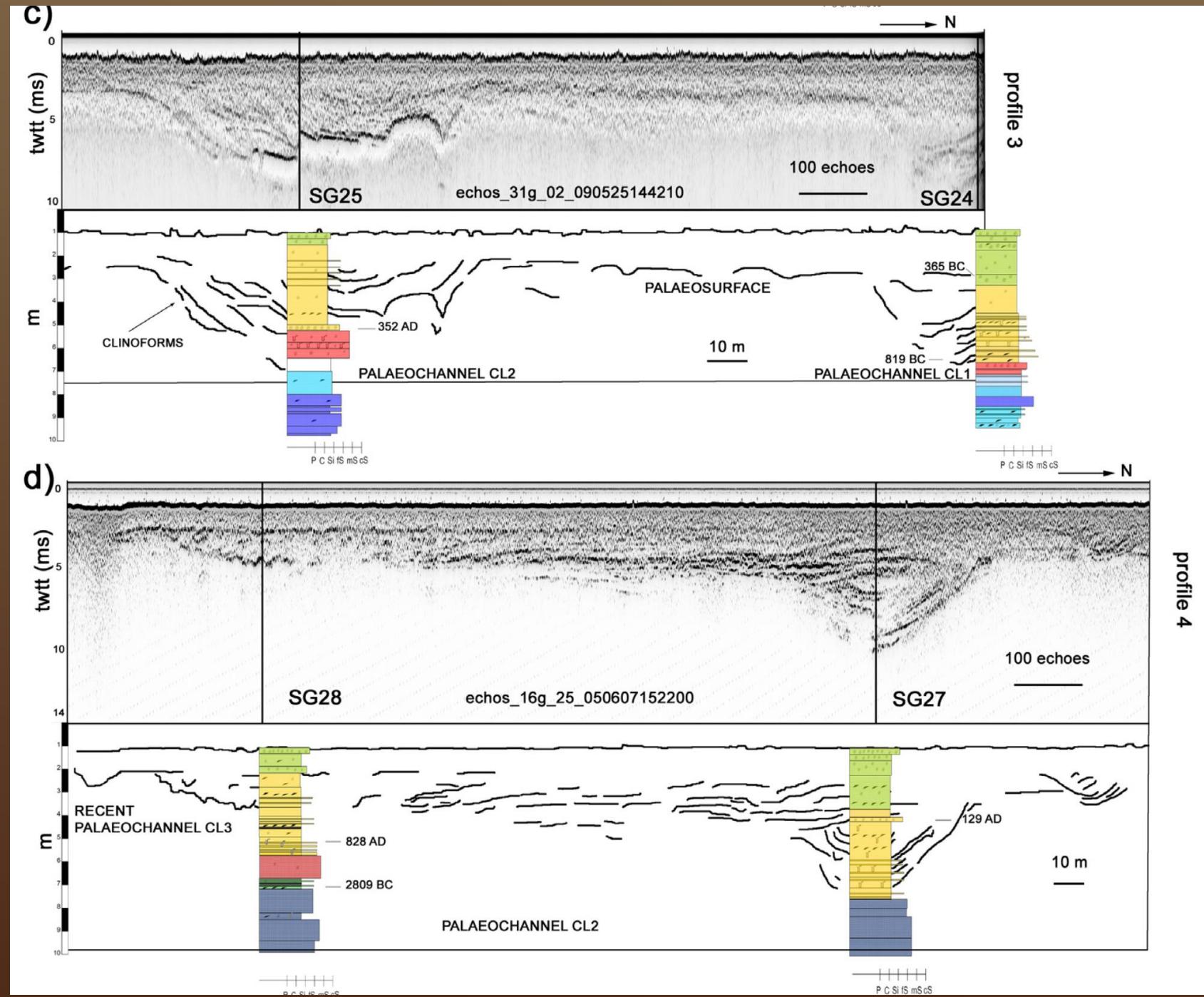
ALLUVIAL FACIES A

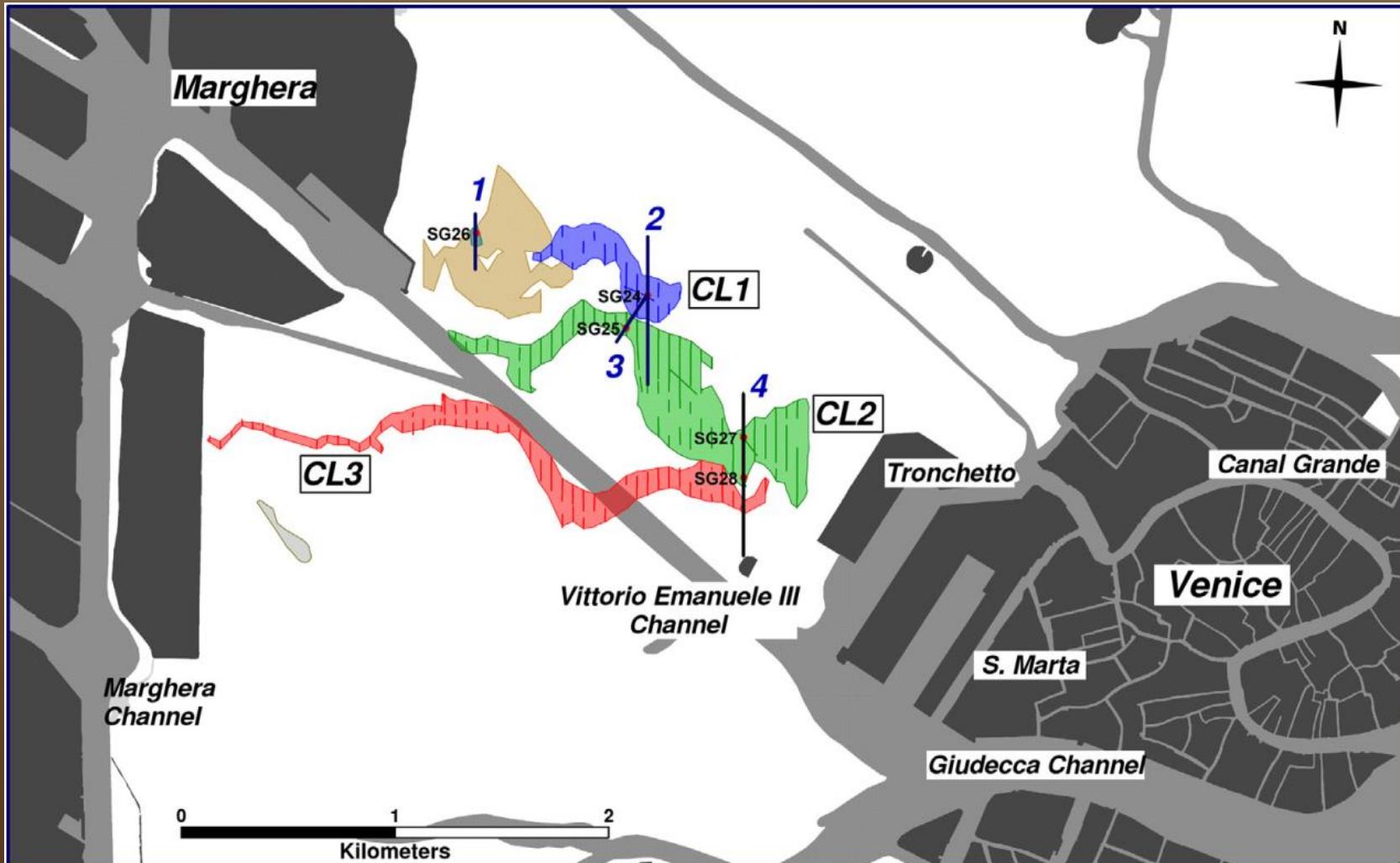
- | | |
|-----|---------------------------------------------------------------------------------------------------|
| Lm | Dark-grey clayey silt with mollusks of mudflat |
| Lcl | Clayely silt laminated with thin sandy layers of tidal channel |
| Lcs | Medium to fine silty sand bodies of tidal channel |
| Lsm | Greenish grey silty clay rich in peat and vegetable remains of salt marsh |
| P | Palustrine facies: bioturbated dark clay rich in vegetal remains |
| Aa | Consolidated sediments with reddish mottling and carbonate concretions (weathered fluvial facies) |
| Af | Clayely silt of floodplain |
| Al | Clayey silt interlayered with silty clay, silt, sandy silt and fine micaceous sand of levee |
| Acs | Clayey silt interlayered with silty clay, silt, sandy silt and fine micaceous sand of crevasse |
| Ac | Clayey silt interlayered with sand of channelized deposit |

P = peat; C = clay; Si = silt;
 fS = fine sand;
 mS = medium sand;
 cS = coarse sand







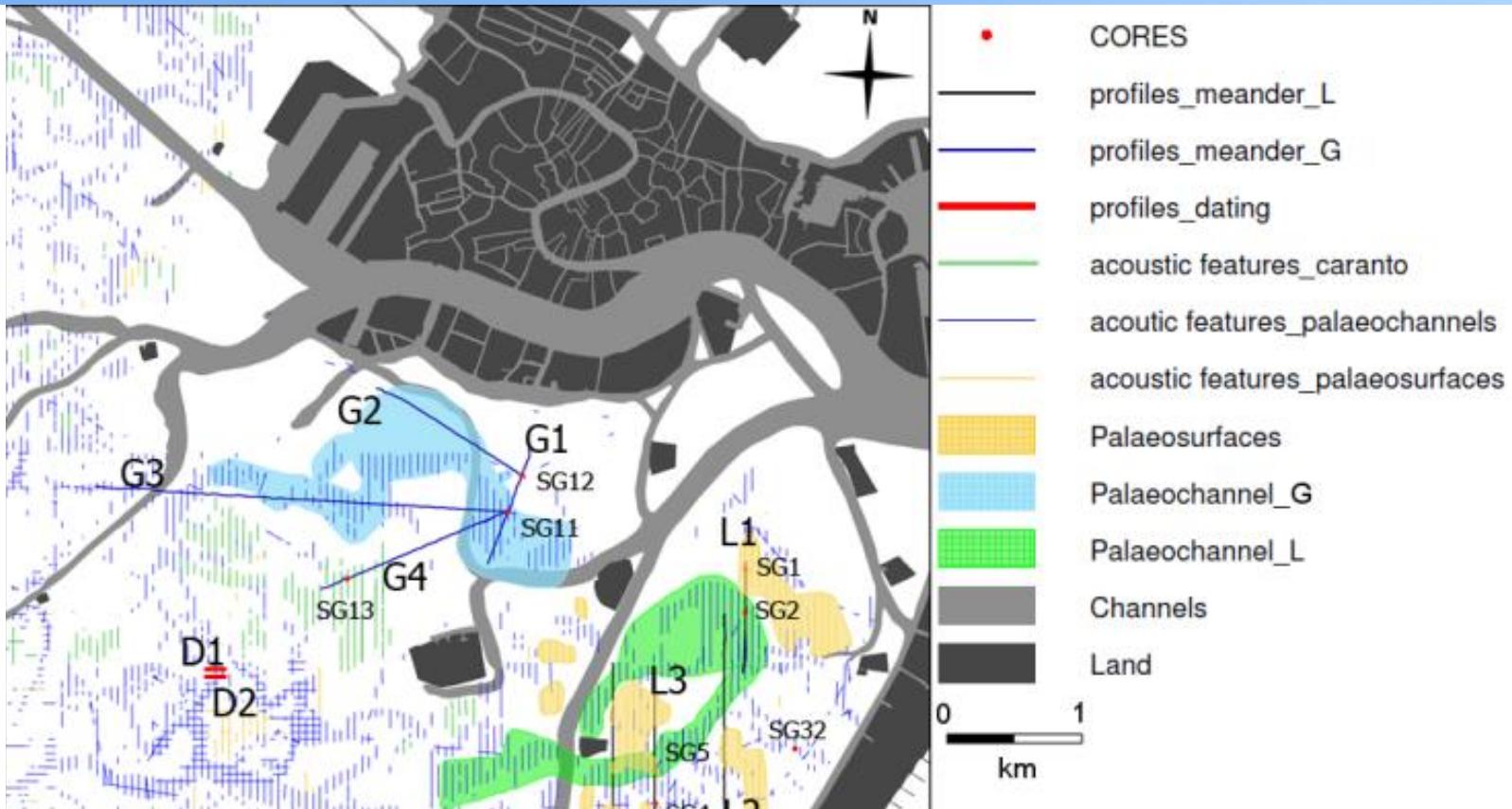
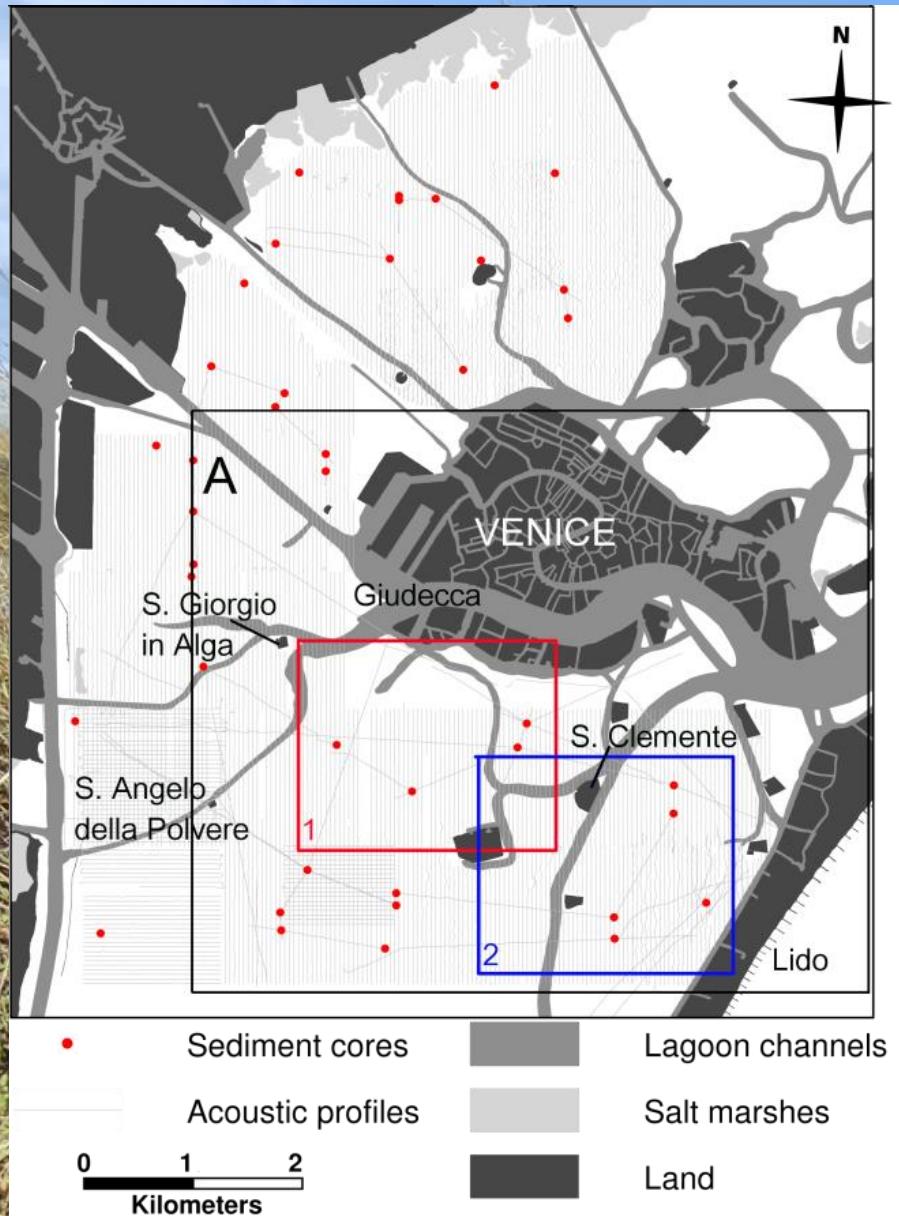


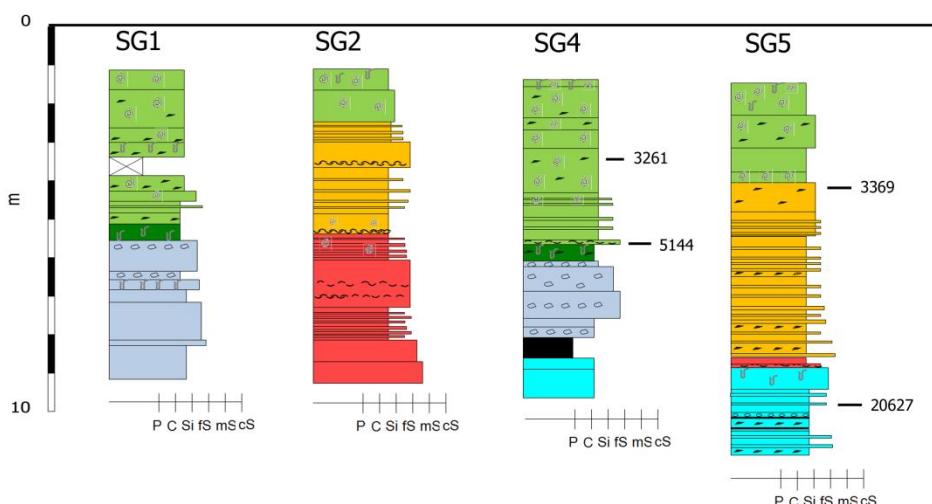
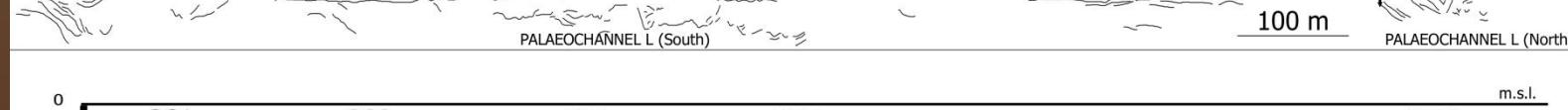
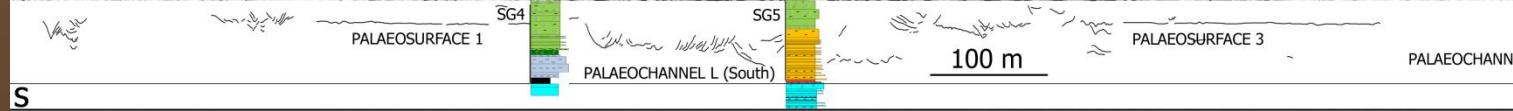
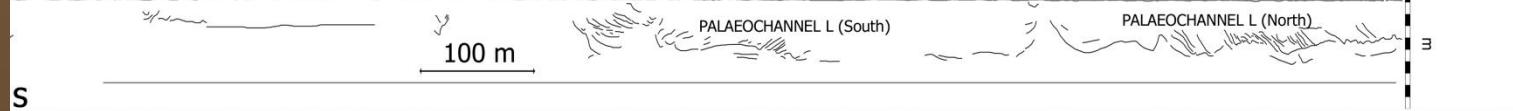
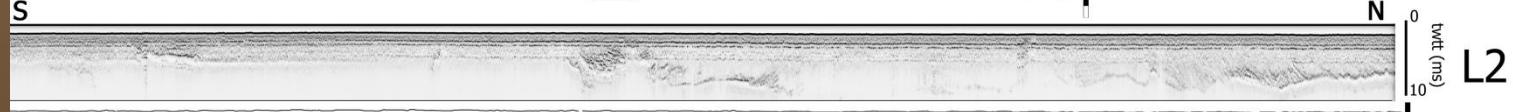
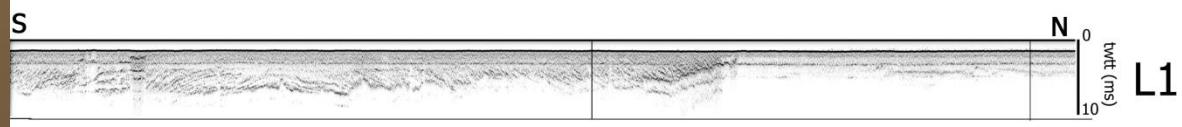
- | | | | | | |
|--|-------------------|--|--------------------|--|----------------------------|
| | Palaeochannel CL1 | | Ancient salt marsh | | Land today |
| | Palaeochannel CL2 | | Caranto | | Sediment cores |
| | Palaeochannel CL3 | | Channels today | | Acoustic profiles of Fig.3 |



present
d

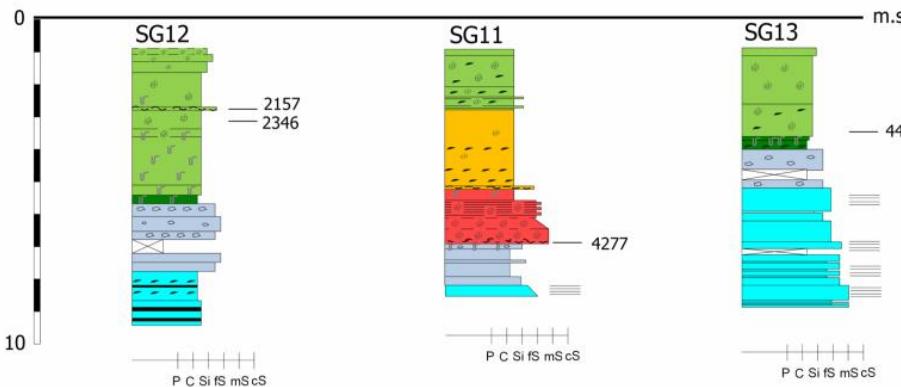
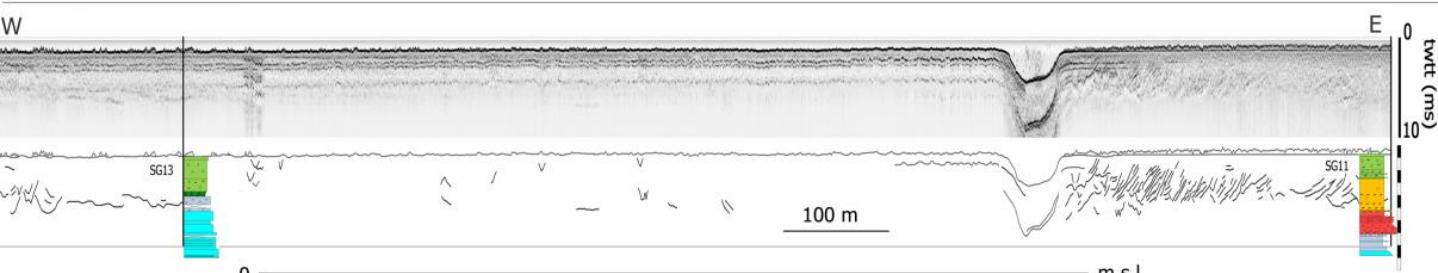
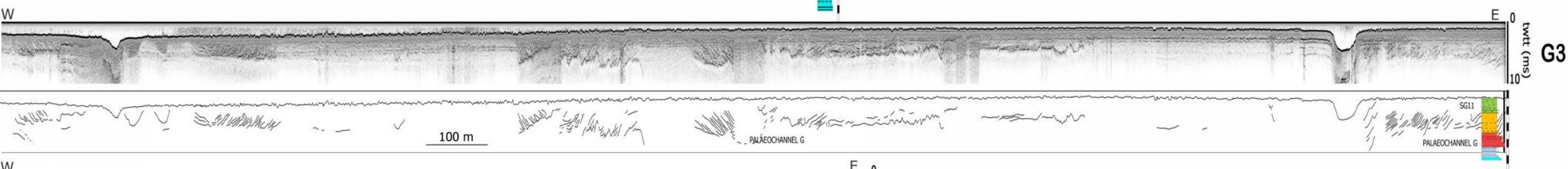
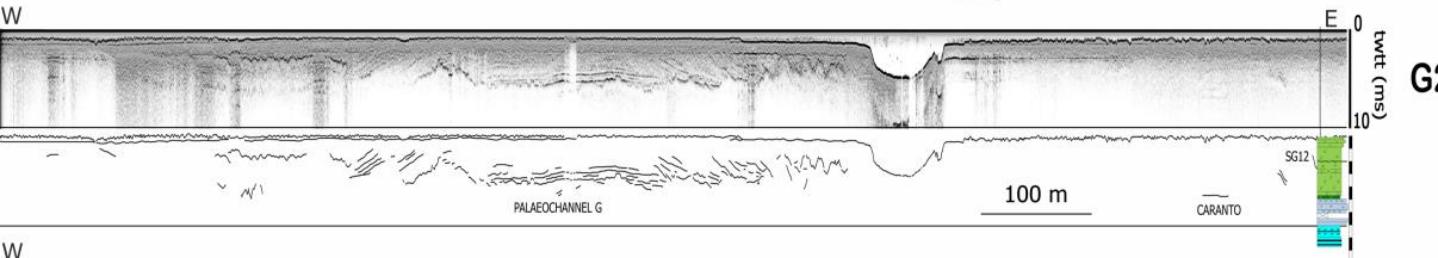
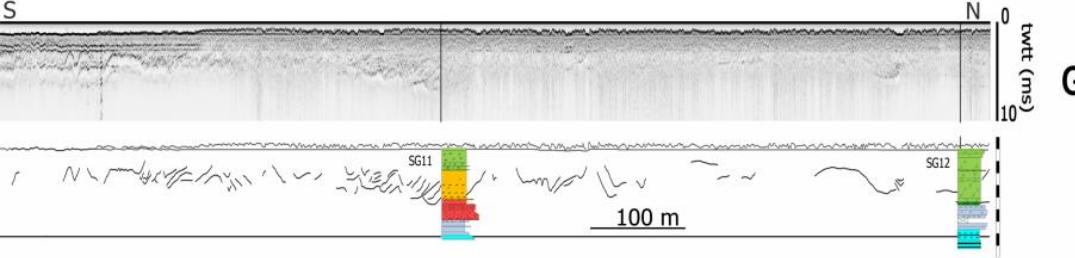




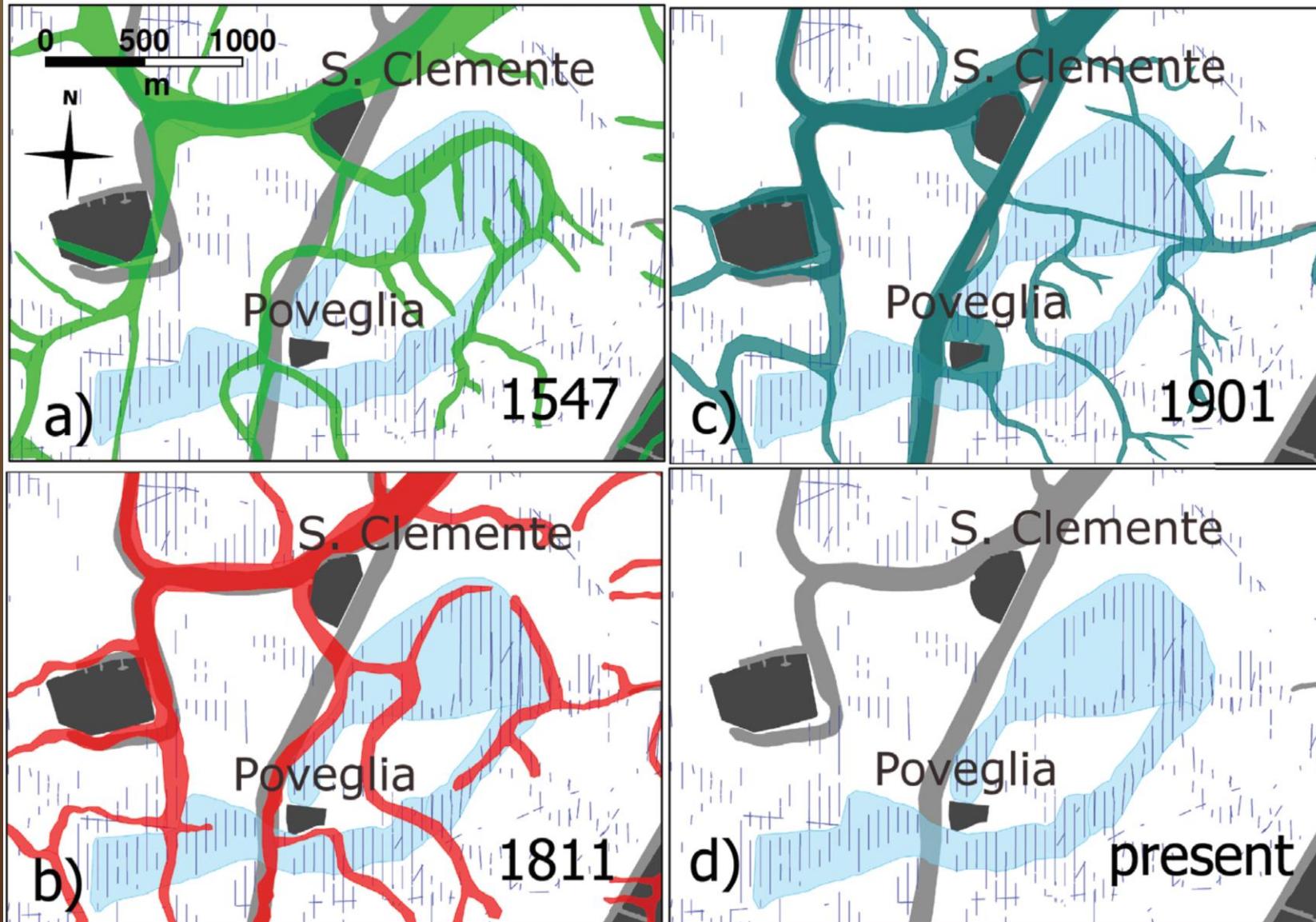


Donnici et al., 2017

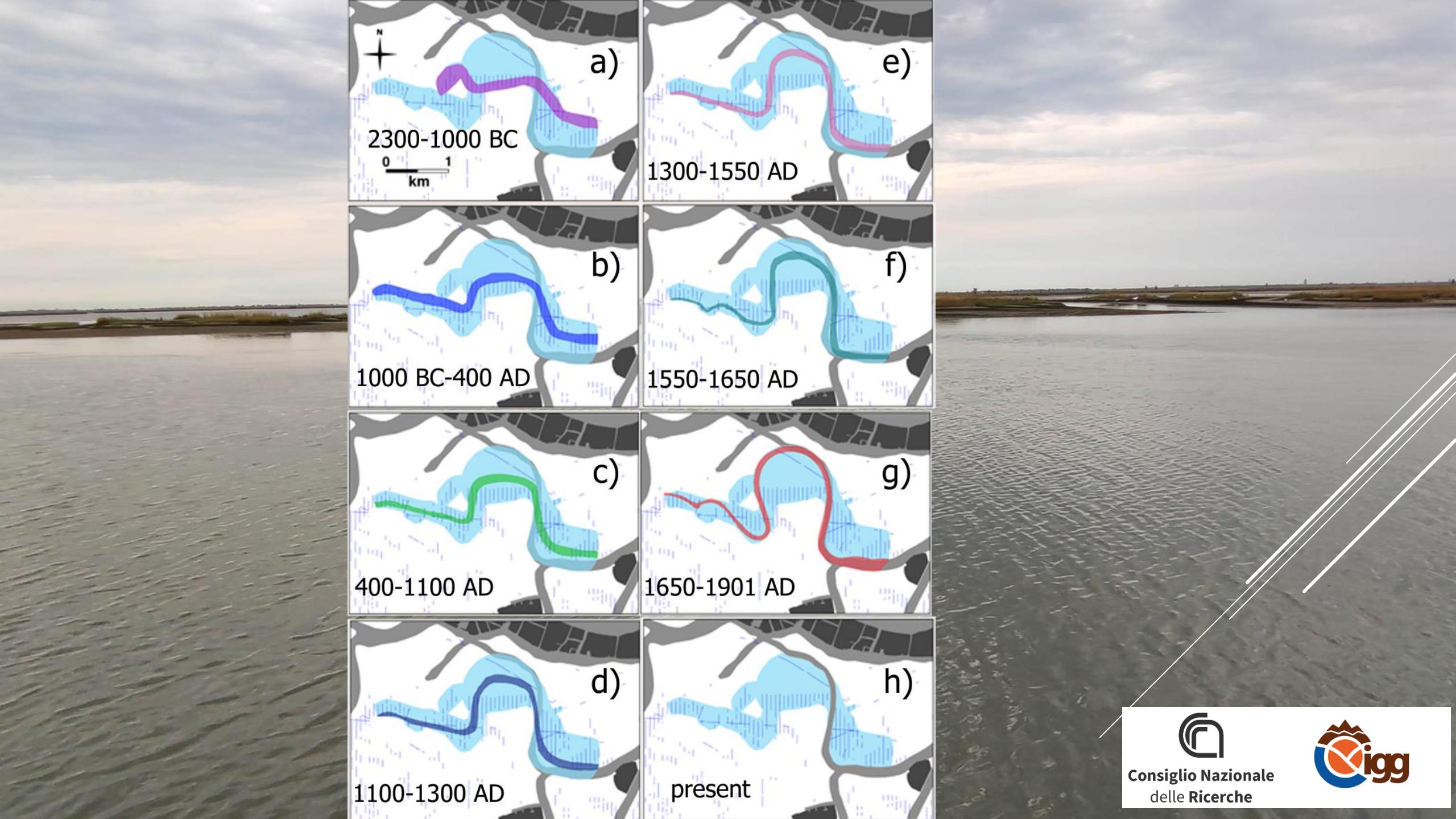
S



- █ Lagoonal facies-mudflat Lm
- █ Lagoonal facies-channel LCI
- █ Lagoonal facies-channel LCs
- █ Palustrine facies P
- █ Weathered alluvial facies Aa
- █ Alluvial facies A
- █ bioturbation burrows
- ~~~~~ mollusks shells
- vegetal remains
- peat
- carbonate concretions
- ===== planar lamination
- NNNN calibrated 14C age (yrs BP)



E' stato possibile datare le strutture sepolte più recenti
per mezzo del confronto con le carte storiche





Grazie per l'attenzione







Barena naturale



Biocenosi - Associazione totale



ASSOCIAZIONI DI BARENA LAGUNA DI VENEZIA



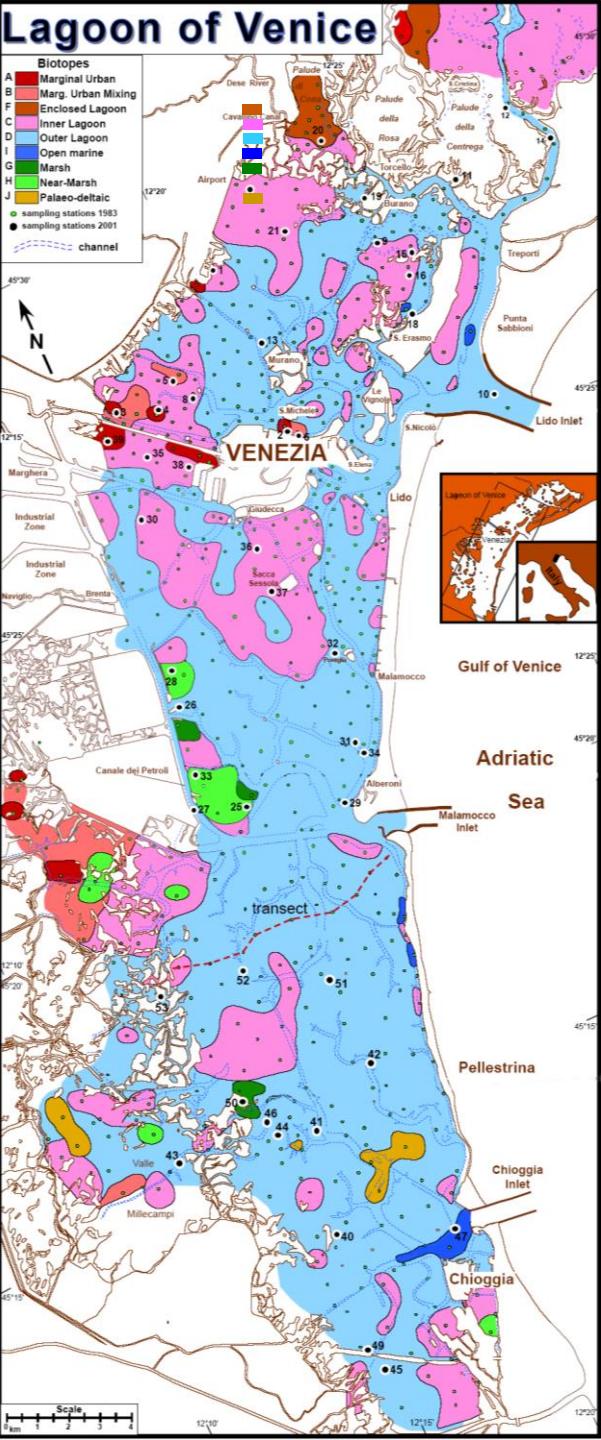
Cibronionion granosum



Haynesina paucilocula



Trochammina inflata



Ammonia beccarii



Quinqueloculina seminulum

